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FEBRUARY 1931

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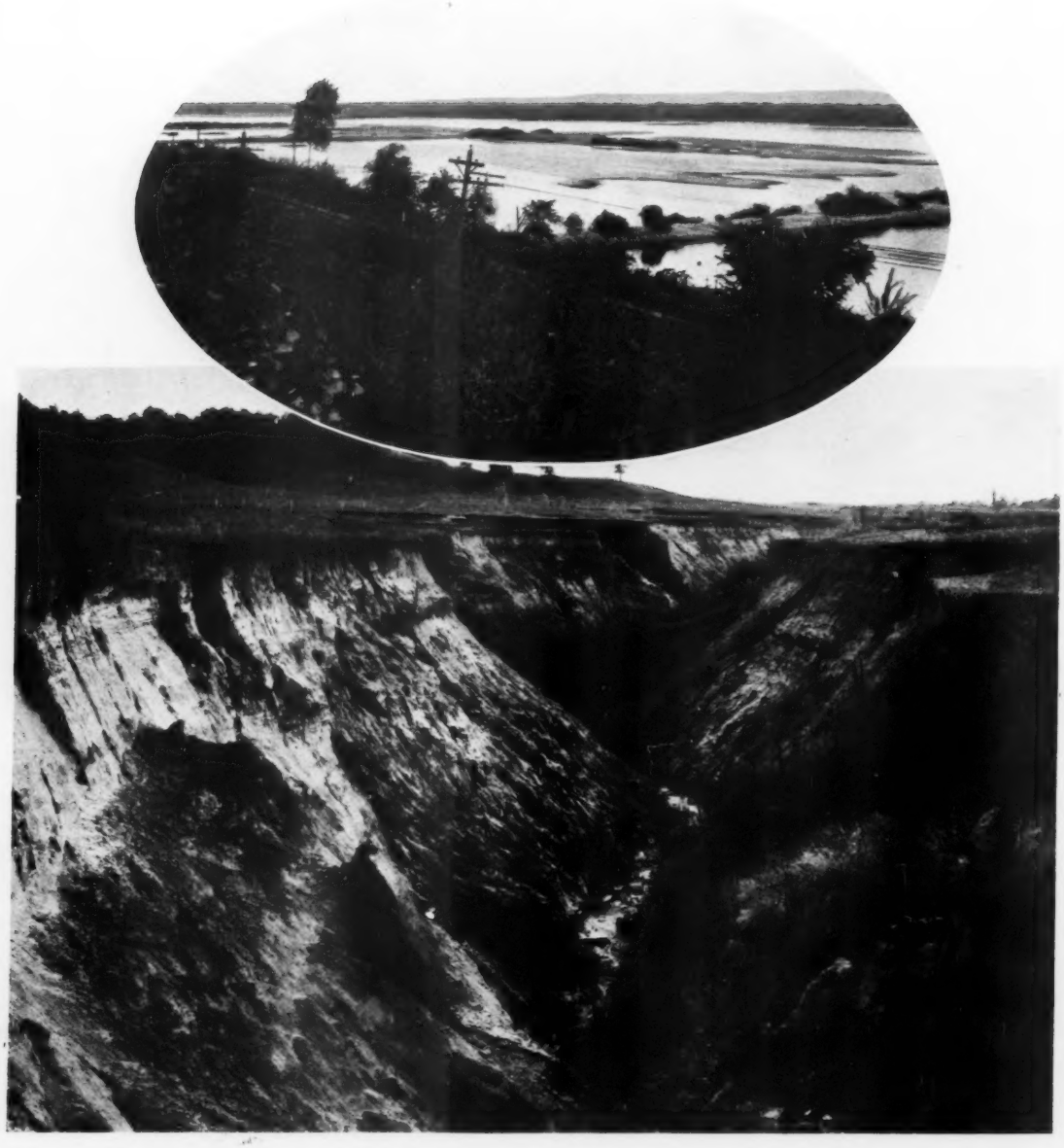

Above: The Mississippi near La Crosse, Wisconsin, at low water stage in August, 1930. The amount of filling between jetties that have been built in the upper Mississippi to narrow and deepen the main channel testifies to the heavy load of silt being thrown upon the river below the Twin Cities.

Below: A million-cubic-yard gully, cut through the center of a nearly level field in Jackson County, Wisconsin. Such gullies can easily be arrested and eventually filled by a single soil-saving dam. Is it a sane policy to leave such control measures to the initiative of hard-put landowners?

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Chaining the Father of Waters

By C. G. Bates

Is the far-flung effort to chain the mighty Mississippi to its channel floor "just one more mistake of a blundering, destructive civilization"?

In seeking an answer to this question, the author, who has spent over twenty years in studying stream and soil erosion influences, "asked the streams" that feed the great river. From their testimony he has written this article—a challenge to the present program of spending millions for flood control and nothing for flood prevention.—Editor.

THE present plight of the Mississippi River reminds me of nothing so much as that of some fierce, captive animal, behind bars but untamed. Its natural mantle scarred and half destroyed, starved, defiled by every manner of carrion thrown into it, looked upon with lust by people who can yet see in it money-making opportunities, it still maintains an unbroken spirit and awaits only an opportunity to destroy its captors. For the song of the river, as of the brook, has ever been:

"Men may come and men may go
But I go on forever."

Probably never before, or at least not since, "Ole Man River" was the main artery of commerce for the central region of the United States, has it received so much attention as at present. With the rapid development of railroads, the Mississippi was largely forgotten by the commercial interests of the country, and hence by the people at large, except those living in its immediate proximity and constantly threatened by its floods. To these must be added the corps of Army Engineers who have for more than half a century been coping with the flood problem, and the commercial and political interests who stood to profit through their engineering enterprises.

The great flood of 1927 on the Mississippi, while not the largest, was undoubtedly the most destructive in the river's history. It thoroughly awakened the general public to the

Deposits from numerous gullies in a small valley in Wabasha County, Minnesota, which drains into the Zumbro River, show the source of many of the problems of the Mississippi channel. The coarse material deposited here may be passed on to the larger channels and eventually to the main river to confound the engineers. How simple a matter to retain it here, or still farther back and thus simplify flood control in the main river.

importance of this lazy giant that drains forty per cent of the country's area, and it aroused more political pressure than any previous rampage, to have the giant put in chains. In view of the vast expenditure of public funds involved, running into hundreds of millions, it becomes a subject every citizen should understand as fully as possible.

Much of the agitation immediately after 1927 for protective measures against flood damage on the lower Mississippi was legitimate enough. As usual, the American people were willing to rush to the aid of suffering humanity with their purse-strings loosened. There was a nation-wide demand that everything be done that could be done to prevent a recurrence. The Army Engineers have come forward with a plan which includes something more than bigger and better levees, although it still places sole dependence on the ability of man to cope with flood waters after they have accumulated in the main channel, or at least in the larger tributaries. But practically not one word of encouragement has been given to flood prevention at its source, despite the fact that many possibilities have been suggested and are believed feasible by engineers and other experts among the laity. But, if mistakes of policy have been made they should not be held against the engineers primarily, so much as the sectional interests which force their hands.

Can we expect successfully to cope by a direct frontal attack with anything so powerful as the Mississippi in flood stage? Is it not time to realize that any engineering works planned in this wise represent the proverbial "house built upon sands" and that the larger and more extensive they are, the greater will be the catastrophe should they be eventually swept away? Engineering failures in all lines are possible, since engineers, after all, are only human. Many catastrophes from the breakage of dams should warn us that the age of mistakes has not passed.

The present agitation for improvement of the channel of the upper Mississippi for the purposes of navigation is probably in part an echo of the country-wide interest in the entire river and in flood prevention, but has little organic connection with flood prevention. There is no apparent reason why the two things should be considered piecemeal. In the belief that river commerce will quickly spring up if only the Mississippi is made navigable to larger vessels, the people of the upper Mississippi Valley region have demanded their share in the benefits which may arise from expenditures for river "improvement." Army Engineers, while obviously and properly hesitant to attack the job, have put forward seriously but one plan by which the demanded nine-foot channel may be had. This plan means the abandonment of the works which have been built in the unfulfilled attempt to effect a six-foot channel to the Twin Cities. In their place a succession of low dams and locks at intervals of about twenty miles is to pond the water and give the necessary depths. This ponderous effort to "control" the magnificent Mississippi will appear to many as just one more mistake of a blundering, destructive civilization. Attempt will be made to show that the intended objective can not be reached in this way, at any cost which can be justified.

The Father of Waters at Winona, Minnesota, August, 1930, where a swift-flowing small stream has emptied its load of sand directly into the Mississippi, which is unable to move it until the delta has formed a natural jettie and a swirling current across its tip. Such despoliation of our streams is clear evidence of what is taking place upon our land.

In the so-called "Flood Report" (House of Representa-

tives Document No. 573, 70th Congress) submitted to Congress by the Secretary of Agriculture as a result of inquiries initiated after the 1927 catastrophe, the Forest Service has cautiously suggested that the recent great floods in the river might have resulted from the clearing of about half of the original forested area of her watershed within the past century. Too many other changes have occurred at the same time to make this a clear-cut case.

The present discussion is concerned mainly with the agricultural sections of the Mississippi Valley, and particularly with

The upper picture shows soil erosion stealing in upon a farm in Vernon County, Wisconsin. The farm problem in erosion is to prevent the loss of the very best surface soil of fields, which—once lost—any amount of fertilizing cannot at once replace. The lower view shows the first steps in prevention—contour terraces which interrupt the down-hill runoff, move the water slowly away and leave the soil behind. Contour plowing as shown in this view is also helpful in increasing absorption of runoff.

southeastern Minnesota and southwestern Wisconsin. The writer does not suggest forestry as the primary cure for the evils that beset the Mississippi. Rather such forestry as is possible should be combined with a sensible and conservative use of all of the land, with systematic soil conservation, and with water storage in the only ways that are possible and consistent with the needs of agriculture in a broad sense. The principle is, however, the same as though conservation through forestry were being advocated.

Soil vandalism is the greatest economic problem facing the conservation forces of this country today. Despite our vast expenditures for agricultural education, a large part of the good farm soils are being despoiled at an alarming rate. The despoilation of our streams, while serious enough in itself, is merely a symptom, an inevitable concomitant of what is taking place upon the land.

During the past spring, characterized by a series of two or three unusually hard rains at the time when small grains were just sprouting, fully an inch of soil washed from sloping fields of southeastern Minnesota and southwestern Wisconsin—not in a single instance, but in hundreds of them! Innumerable small gullies all over the fields, varying from two to twelve inches deep! The measured equivalent of one-tenth inch from a forty-acre tract deposited on the lower, flatter portion of the same or adjoining field! It is impossible to estimate what proportion of such soil movement is completely lost to the individual farm or community. But the total quantity reaching the larger streams, and eventually the Mississippi, must be enormous. In southwestern Wisconsin, a water sample from Buffalo River after a sharp rain, showing five per cent silt content, which, if representing only an hour's flow, would mean more than 90,000 cubic feet, or 3,000 cubic yards of silt brought to the Mississippi! Such occurrences as this are not rare. They are to be noted, here or there within a limited region, many times in a normal summer season. Bridges washed out or even buried by sand; roads, fields, even towns covered by flood waters and deposits of mud! In the aggregate these things tell the story.

Streams are lazy things, dropping their loads at the slightest pretext, and this is particularly true of the small, short-lived torrents which are the "gully-washers." Yet, from one gully on a single farm one million cubic yards of soil had been removed in a period of thirteen or fourteen years. In this same locality an area of eight square miles showed total gullying amounting to 40,000 cubic yards per square mile per year. In an area where smaller gullies are the rule, the average for seventy-five square miles was 4,000 cubic yards per square mile per year. Again, a single gully which has ruined a farm in a period of less than ten years, has moved nearly half a million cubic yards of soil, but three-fourths of this quantity, representing the coarser material, has been deposited on the adjacent bottom-land, covering forty acres to an average depth of five feet. Much

of this material will be moved further in some season when the entire bottom-land is flooded.

A more comprehensive estimate of the total and average amount of erosion is needed than can possibly be obtained by the study of individual small land areas. Although realizing that averages covering every condition of drought and flood could alone tell the complete story, it seemed logical to ask the streams what burdens they were being compelled to carry. Accordingly, during the late summer of 1929 and through most of the summer of 1930, seventeen streams in southwestern Wisconsin and eight in adjacent Minnesota, all directly or nearly directly tributary to the Mississippi, were sampled as systematically as conditions would permit. About 1,150 samples were taken. The summer of 1929 witnessed many hard rains in this region. The year 1930 supplied only a small May flood on the river. The remainder of the summer and fall was unusually dry, with few rains of sufficient severity to raise streams more than a few inches. Although some of the 1929 samples and a few of those taken early in 1930 thus represent fairly high water resulting from rains, no severe flood conditions have boosted the silt loads beyond what may be expected at almost any time.

The rate of movement of silt under such conditions has given a substantial foundation to the estimate that fifteen million cubic yards of silt are brought annually to the Mississippi within 140 miles of its length, from an area of 10,000 square miles of fairly uniform topography in Wisconsin and Minnesota, of which the study area is a sample. This is equivalent to 1,500 cubic yards per square mile per year for the area, in contrast to the much greater quantities eroded from small areas of acute gullying. But these fifteen million cubic yards represent only a part of the area which drains into this section of the Mississippi. If the large but less critical additional area tributary to this same section of the river and the untold possibilities of loads carried by infrequent floods are considered, an estimate of twenty-five million cubic yards annually brought to this section of the Mississippi from the Chippewa River to the Wisconsin, inclusive, is probably very much on the conservative side.

Whence comes the silt carried by streams? In this region only about one-third of the entire area is actually in cultivation. Yet, beyond a doubt the cultivated fraction yields the great bulk of the silt. Forested areas contribute practically no runoff and even less of silt, except as streams from tableland fields cut gullies through them. Hayfields are also quite safe. Pastures, especially short-grass pastures on good soil, which are broken and seeded at intervals, yield runoff most freely, but on the whole keep their soil in place. It is the fields in corn and small grains which yield to the runoff waters their great burden of silt. Both the gradients and the soil types of such fields can be duplicated over large areas in the Mississippi basin, so that it seems to the writer quite probable that there are extensive areas on other watersheds, from the Dakotas to Tennessee and Louisiana, which per square mile are making quite as large or larger silt contributions to their streams. Certainly there are many extensive farming localities in the South in which destructive gullying is quite as common.

Let us consider what this contribution of a possible twenty-five million cubic yards of silt in a limited sector of the upper Mississippi may mean at flood times and may mean to either flood control or navigation.

If the silt, which is carried as suspended load by the swift-running and turbulent small streams flowing from an eroding area, could be carried in suspension for indefinite distances, there would be only simple problems for river engineers to cope with. Unfortunately this is impossible. The turbulent stream will certainly, after entering the larger permanent stream channels, gradually be slowed down by decreasing gradients, and at each stage the coarser elements of the load will drop to the bottom of the stream. In such a relatively quiet stream as the Mississippi, therefore, we find that only the finest or lightest elements are being carried in suspension. This is true "silt" in contrast to the gravel, sand and fine sand which have been successively dropped along the way.

In the event of a high flood, part of the dropped load is left "high and dry" by the subsiding waters and is not liable to movement until a similar or larger flood disturbs it. In the regular channel of the stream it is readily seen that material which was, at one point, a part of the suspended load, has become a little farther downstream part of the "bed load." In this situation the load ceases to move with the full velocity of the water and only the surface layer moves at all, being rolled along at a slower speed which depends on the character of the particles as well as the velocity of the water just above. Then there is the part of the load of intermediate character which bounces along, half rolling and half in suspension. In swift waters this part of the load may include a good share of the finer sands.

In the movement of the bed load, width and velocity of the stream are all-important, depth important only as it directly increases average and bottom velocities, and gradient is important beyond its effect on velocity. Without going further into the detailed considerations which govern, it may be stated as practically inevitable that the total capacity of a large stream to move bed load is less than that of its combined tributaries, for the primary reason that the width of the larger stream is almost always less than the combined widths of its tributaries, and the average depth much greater. When, therefore, we have evidence that the tributary streams are at all times severely taxed to remove the loads left in their own channels, it is ample evidence that the parent stream is overtaxed and cannot move the load thrust upon it. This is the situation of nearly all of the tributaries of the Mississippi included in the above estimate, as shown by the bars, the condition of the banks and the unceasing bed-load movements in their lower reaches. The low gradient of the Mississippi may be compensated by the somewhat freer movement of the deep water, but its width is hardly greater than that of either the Chippewa or Wisconsin at their respective mouths, and the capacity for moving bed load is obviously not much greater.

Just how much the Mississippi between the Chippewa and Wisconsin Rivers may be overtaxed to carry its bed load remains to be definitely proven. Excluding flood stages when the capacity and load may be greatly increased, there is being moved, according to the best estimates which are possible at this time, only about twenty per cent of the silt brought to the Mississippi in this sector. Whether the normal movement of silt in the Mississippi represents twenty per cent or forty per cent of the load brought to it is not of very great importance. When the load brought in by tributaries is heavy, deltas, flood-plain deposits, and bars and islands in the channel itself are formed: while, when the contributions from the side are less than the capacity of the Mississippi, (if ever,) it may gnaw slowly into these deposits. But the river channel is being filled with great quantities of silt which can only by any possibility, be moved downstream in times of high or very high water.

In order to see what is imposed upon the stream by such accumulations, let us arbitrarily assume that a flood of 100,000 c.f.s. with a rather improbable duration of a month comes in the upper river after a period of ten years of such deposition, and that such a flood is capable of moving all of this accumulation. The addition to the average flood discharge for such a period (*Continuing on page* 106)

Sunset on the open reaches of the upper St. John's River, in Florida.

With Fuertes in Florida

By Alden H. Hadley

THERE is an old saying with which everyone is familiar: "It's an ill wind that blows no one good." It was literally an ill and tempestuous wind that, many years ago, blew me into my first meeting with Louis Agassiz Fuertes—a meeting out of which was to come one of the most delightful experiences of my life.

As is well known to those of Fuertes' friends who have followed his career, his friendship with Elliott Coues and Abbott Thayer exerted a profound influence on his life. The year after he had placed himself under the guidance of Thayer, he took his first field trip of consequence. This was to the east coast of Florida, and was made in company with Mr. Thayer, his son Gerald and Charles R. Knight, the since distinguished animal artist.

By one of those singular tricks of fate or fortune for which there is no accounting, it became my privilege to conduct Fuertes and his companions to the region of the upper St. John's marshes. In 1897 my family had moved to Melbourne, and for almost a year the country about North Indian Field had been my favorite collecting ground, and during the late winter and early spring of 1898 I had spent several weeks studying and collecting the birds of that then marvelously interesting section.

Immediately after returning from this collecting trip, I had joined some friends in a cruise down the coast to Indian River Inlet, where several days' fishing were enjoyed. The purpose of this expedition having been abundantly fulfilled, one morning under favoring winds, we headed our schooner up the Indian River for Melbourne. The steady breeze of early morning continued to freshen and some wisps of flying white scud came driving ominously across the sky out of the southwest. Sail was shortened, for we knew we were in for what the natives called a "howling southwester." The gale continued to increase in violence and we were soon plowing along at a great rate, leaving in our wake a seethe of boiling, churning foam. Driving thus along, we had expected to reach Melbourne before night, when all of a sudden, our schooner, perhaps driven a little off her course by the boisterous wind, stuck hard and fast on a mud flat north of Pelican Island and near Oak Lodge, the famous rendezvous for naturalists which Mrs. F. E. Latham had maintained for many years. The more we tried to get the schooner afloat, the harder aground she was driven by the violent wind. All efforts were of no avail, and it was finally decided that further attempts were useless until the wind abated.

In the meantime two rowboats were manned and we headed for Oak Lodge, and were soon pulling through the sheltered mangrove "creeks" that led to Mrs. Latham's resort. As we neared the house, I noticed on the porch, a bronzed, heavily-bearded young man whose garb of brown duck well accorded with his beard and general complexion.

Under most surroundings, I believe, he would have been a fine example of concealing coloration. He was squatted on a somewhat sheltered portion of the veranda, and seemed to be engaged in skinning a bird which was half-buried in a generous quantity of cornmeal. May I pause to say that I shall ever owe a debt of gratitude to Louis Fuertes for showing me the tremendous value of cornmeal in all processes of skinning birds—a knowledge that I found useful in my collecting days. As I walked up the steps, he looked up from his work, arose, gave me his name and, at the same time, a hearty handclasp. Naturally, it was with a thrill of delight that I met, for the first time, this gracious and gifted young artist-naturalist, about whom I had already heard, and whose genius was one day to be universally acclaimed by the ornithological world.

The first few minutes after our meeting were full of an interchange of notes concerning our Florida experiences. He narrated to me the results of his studies and, collecting about Oak Lodge, and I, no doubt, gushing with youthful enthusiasm, told him of my most recent experiences in the St. John's marshes. He apparently was so impressed with the glowing account which I gave of the richness of the bird life of that region that he ended by asking if I would not conduct him and his companions to my favorite collecting ground. My delight, of course, was unbounded at the thought of the privilege of such companionship, and I hastened to tell him that I would be more than glad to go.

Fuertes now turned to his companions, whom I had already noticed under a clump of cabbage palms about a stone's throw from the house. Mr. Thayer and his son, Gerald, who at that time was about fourteen years of age, were busily engaged skinning birds, while Charles R. Knight, whose most striking external characteristic at that time was a luxuriant shock of wavy hair which fell almost halfway to his shoulders, stood idly looking on.

How vividly this picture all comes back to me today; and with it the thought of how intrically interwoven are the threads which guide our destinies. As I have looked back from the vantage point of the years and pondered upon this chance meeting in that secluded spot with these three men, whose outstanding genius has taken them to the highest pinnacle of fame in their own special fields of endeavor, I more than once have been grateful for the tempestuous wind that sent our schooner aground, and therefore made possible this meeting which to me, a budding young ornithologist, has meant so much all through the years.

Thayer and Knight immediately gave hearty approval of Fuertes' suggestion of a trip to the headwaters of the St. John's and it was agreed that they should meet me in Melbourne early the following week.

A few days later, arrangements having been made for a wagon and camp attendant, we started on our expedition. A trip by wagon to North Indian Field at that time consumed the greater portion of a day. Such a journey, to an ornithologist, however, was one of absorbing and ever-changing interest. The trail wound through heavy pine woods, interspersed with clumps of saw palmetto and low-lying hummocks of swamp maple, sweet bay and myrtle. Later it led into great parklike vistas with open flower-decked glades and ever-receding timberlines. It is just this sort of country, in spite of its monotony, that has caught many a naturalist and nature-lover in a spell of weird enchantment. Fuertes was deeply sensitive to all this.

By midafternoon we had left behind the pine woods, the home of the red-cockaded woodpecker, the brown-headed nuthatch and the Southern black fox squirrel. To the westward, as far as the eye could see, stretched the St. John's prairies, dotted here and there with small islands of cabbage palms and saw palmetto, while on the faint horizon line there loomed the purple wall of the great Jane Green cypress swamp. From far and near, as we proceeded across the savannas, could be heard the resounding trumpet calls of sandhill cranes, while from time to time pairs or small groups of these stately and interesting birds flew up as they were disturbed by our passing by.

By late afternoon we had reached North Indian Field. In those days this was a lovely spot, unspoiled by the destructive hand of man. In my limited wanderings I do not recall ever having seen a place possessing more romantic beauty and charm.

It consisted of a narrow grove, eight or ten acres in extent, of unusually stately cabbage palms. Rising a few feet in general elevation above the bordering marshes and savannas, it often became an island in time of high water, and always constituted a most conspicuous feature of the landscape in this entire region. On the savannas bordering the grove, at the time of our visit, were luxuriant acres of sweet flags in full bloom. This only served to give added charm to a pic-

—Courtesy National Association of Audubon Societies

Copy of the original painting of a heron group by Louis Agassiz Fuertes, the first studies of which were made during a field trip in Florida with the author. 1. Louisiana Heron. 2. Yellow-Crowned Night Heron. 3. Yellow-Crowned Night Heron (Immature). 4. Black-Crowned Night Heron. 5. Black-Crowned Night Heron (Immature).

ture which has long lived in my memory. In the midst of the grove was a prehistoric burial mound, crowned with lofty palms, perhaps, more than a hundred feet across and rising thirty feet above the surrounding level. Near the base of this we pitched our tent. Distant, not more than a stone's throw, began the marsh—a strange jumble of luxuriant aquatic vegetation, which stretched away for miles until lost in the haze of distance.

Immediately in front of our camp the marsh consisted of a thick massing of lily bonnets and "lettuce rafts" which in turn gave way to extensive reaches of maiden cane, the whole being interspersed with saw grass tussocks, and floating and willow islands. Through this the narrow, tortuous, hyacinth-choked channel of the St. John's wound its sluggish way.

To Fuertes this was a new bird world. He reveled in it with a sort of wild, half-restrained, ecstatic joy. It was a veritable bird-lovers' paradise, and a paradise for birds. Purple and Florida gallinules daintily strutted over the lily pads and "lettuce rafts." Florida dusky ducks were constantly rising as we quietly pushed our boat through the fascinating intricacies of this great marsh world. On a willow island, near our camp, many anhingas were nesting, while farther out in the marsh, on other willow islands, were rookeries of the yellow-crowned, Louisiana, and little blue herons.

Ready for the daily round through the marshes of the upper St. John's River. *Left to right,* Louis Agassiz Fuertes, Charles R. Knight, the author, Gerald Thayer and Abbott H. Thayer.

A spectacle of which neither Fuertes nor the rest of us ever tired was that of a great flock of white ibises which, each morning shortly after sunup, arose from out the cypress swamp—their white forms gleaming like flakes of snow against the somber wall of the cypresses. On they came, mounting higher and higher, until well over the center of the marsh, when, as if by some signal of some leader or by some preconcerted action, the entire flock dropped from the sky, describing in its descent a graceful curve, the air rushing through countless wings, sounding like a sudden gale of wind through a leafless wood.

During our two weeks at North Indian Field our forenoons were all invariably spent wandering about the marsh. Having already secured a fairly good collection of the birds of this region, and also, having acquired considerable skill in the art of using the long push pole which is the only possible method of navigating these marshes, it gave me deep satisfaction to give myself over wholly to Fuertes. On these daily trips through the marshes, Knight usually accompanied us, while Mr. Thayer and his son, Gerald, navigated their own boat. Usually, our two parties saw little of one another until, either tired from our exertions or having been successful in securing specimens or making studies, the heat of the noonday drove us in.

I shall never forget an early morning on the marsh when Fuertes, having secured his first purple gallinule, eagerly and quickly made a sketch, washing in the delicate tints of legs and bill and frontal shield, taking no chance lest the beautiful colors should fade from the lifeless form before he could succeed in transferring them to his sketching pad.

At that time, I was wholly unfamiliar with the estimate which Coues had placed on the work of Fuertes and the prophecy which he had made concerning his future attainments. I, however, quite vividly recall, as I watched him at his work during the all-too-brief fortnight, at that early date, that I had an instinctive feeling, tinged with no shadow of doubt, that here was a man whose unusual talents, combined with an infinite capacity for hard work, would one day take him very far.

Our noons and afternoons at North Indian Field were spent under our deep canopy of cabbage palms. The specimens taken during the morning were carefully skinned and prepared, and Fuertes made many studies and sketches. No moment was devoid of interest; something was always transpiring. Great "leather-backed" turtles crawled up out of the steaming marsh to deposit their eggs in the loose white sand of the ancient burial mound—as it were life coming out of death. Now and then, an Audubon's caracara went hurtling by; and, ever and anon, there came from across the savannas, the trumpet calls of sandhill cranes. Often during the heat of noonday, looking up through a rift in the palm tufts we would see numbers of vultures, anhingas and wood ibises soaring far overhead in the blue empyrean.

Among my happiest recollections of those days at North Indian Field are memories of the evenings spent about the campfire. Here, Fuertes' versatility and geniality were displayed to marvelous advantage. He was past master in the art of story-telling, and the embers of many a campfire faded to a dull glow ere we turned in for the night, so intrigued were we by his entertaining talk and delightful companionship. He was a really wonderful whistler and could, with apparent ease, produce rich, mellow, flutelike notes. I have heard him, for an hour at a time, whistle the difficult parts from grand opera or innumerable snatches from popular Broadway hits.

During our stay at North Indian Field, a small party of alligator hunters camped on a willow island some distance to the west of us, and each night we used to see their bull's-eye lanterns scintillating like elusive will-o'-the-wisps far out over the marsh; and, ever and anon, we would hear the distant report of a rifle and in our fancy would picture some white-bellied saurian writhing in death agonies. The gallinules, disturbed by the gunshots, would set up an immediate outcry until the marsh for miles around would echo and re-echo with their prodigious cacklings. Thus the great golden days went by.

I cannot conclude this sketch without offering a word concerning the relationship between Fuertes and Abbott Thayer. The affectionate regard of the younger man for his teacher, as I sensed it in (*Continuing on page* 128)

Courtesy Isabel Gates.

A pen drawing of the original Greenway Court, home of Lord Fairfax, the beauty and charm of which is fascinatingly described by the author.

Fairfax--Forest Friend of Washington

By H. O. Bishop

GEORGE WASHINGTON was a fortunate young man. When he was about sixteen he landed a job assisting in the survey of the lands of Lord Fairfax, consisting almost entirely of virgin forests, between the Potomac and Rappahannock rivers, in Virginia.

This surveying expedition, which lasted many months, undoubtedly gave Washington his great love for and knowledge of trees, which cropped out so frequently all through his after life. The friendship between Lord Fairfax and George Washington was an unusual one and lasted until the death of the former at the end of the Revolutionary War. Thomas Fairfax, sixth baron, was born in England in 1691. He was forty-one years old when Washington was born. During the Wars of the Roses his ancestor, Sir Guy Fairfax, became Chief Justice of England. The father of this famous American Lord Fairfax, the fifth Lord Fairfax, was the husband of Catherine, daughter of Lord Culpeper. It was through her that the vast estate in Virginia was inherited by the man who became Washington's great outdoor friend. Lord Culpeper originally received the property as a grant from the King of England. A love affair that went topsy-turvy was the thing that caused Lord Fairfax to give up the gay and luxurious life of London, cross the Atlantic in a little sailing vessel and spend the rest of his life in the American wilderness, where he ever remained a bachelor.

The little stone house at Greenway Court which served as an office for Washington when he was surveying the Fairfax properties.

After finishing his education at Oxford he received a commission in the Royal Regiment of the Blues. Life in the barracks, however, proved too humdrum. He craved social activity. Shortly he resigned his commission and became known as one of the most popular young men in the fashionable social set of London. There was nothing going on socially in which he did not have a hand. His family position and his charming personality caused front doors to be opened to him. He traveled a

swift, exciting and happy pace. He became a sort of typical "man about town." At one period of his life this brilliant young man won the plaudits of England by taking a deep interest in things literary. He became the boon companion of Joseph Addison, who was then struggling with his pen, pipe and threadbare coat in an attic. Fairfax and Addison became literary lions. The peak was reached by Fairfax when he contributed several articles to *Spectator*. Few aristocrats at that time were literary men. A writing nobleman was a novelty.

And then one day he found himself madly in love. Happy days followed. He and his fiancee were the toast of the town. He showered the lovely maiden with beautiful presents. It looked as though the future was an endless path of roses.

And then the tragedy. Another man abruptly appeared on the horizon, and the maiden transferred her favors. That was the end of Lord Fairfax's social career in London.

A happy thought came to him. He recalled the vast forests in that faraway Virginia, somewhere in the New World, which he had inherited from his mother. He recalled that some years previously he had casually turned over the management of this estate to his cousin, Sir William Fairfax. Sir William had settled among the Puritans in New England, but moved down to Virginia when this advantageous offer was made him. He settled at Belvoir, a plantation on the Potomac River, a few miles below Mount Vernon. Lawrence Washington, half brother of George Washington, married his daughter.

The young surveyor—George Washington at eighteen years of age.

When the disconsolate Fairfax arrived from England and visited his cousin at Belvoir, he found the Washingtons and Fairfaxes to be the best of friends and genuine neighbors. In looking over the records of his estate he came across some maps and surveyor's notes that attracted his attention. Upon inquiry he found they had been made by young George Washington who had assisted his nephew, the son of Sir William, in making a survey of his property. Then and there began the acquaintance of the British nobleman and the young man who was destined to lead the American Army to victory, thus securing political and industrial freedom from the mother country. Despite their difference in age, they became not only friends, but cronies. They hunted and fished together. It is reasonable to assume that the polished and experienced man from England had a wholesome influence in shaping the future conduct of the country boy.

Life at Belvoir was not what Lord Fairfax wanted. There was too much society—too many reminders of that soul-wrenching affair back home, which he wanted to forget. He decided to go west, and eventually located on that portion of his property which became known as Greenway Court, about twelve miles from the town of Winchester. To reach this place was a long and dangerous journey. The mountains and many streams had to be crossed. It was considered far, far away from Belvoir. Yet the once gay Fairfax made the journey in safety and established his home.

According to an old narrative of long ago, "Greenway Court stands on a grassy knoll, over whose soft turf droop the boughs of lofty locusts, and oak trees—the former in the springtime almost hiding the low roof with fragrant masses of delicate blossoms. It is a long building, constructed of the limestone of the region—but a single story in height, with dormer windows, however, projecting far out from the roof, serving to light a second range of apartments. This roof slopes down into a long species of veranda, extending the whole length of the building, after the fashion of those old Virginia farmhouses, now so often met with on the roadsides, and employed for tavern purposes. At each end of the mansion is a chimney, studded with coops, around which swarm swallows and martins—and two wooden belfries are situated midway between—constructed probably by the original owner, to give an alarm in case of an inroad of the savages. The old bells ring no more—they are so old now, and their tongues are silent—but if they rang again, how strange would the chimes sound! How like the garrulous and cracked voices of age, telling of other days, and scenes that have passed!

"Not many paces from the old mansion is a small wooden house, in which the eccentric Fairfax slept, surrounded by his dogs, of whom he was passionately fond—the larger edifice being given over to his steward. A small cabin of stone, near the north end of the house, was his office; and

Courtesy Isabel Gates.

Greenway Court as it looks today, framed and shadowed by ancient trees.

here he transacted all the business of his vast possessions, giving quit-rents, signing deeds and holding audiences, to adjust claims and boundary lines. Scattered about the knoll were quarters for his many servants—and here, in the midst of dogs and horses, backwoodsmen, Indians, half-breeds and squatters, who feasted daily at his profuse board, the fine gentleman of Pall-mall, the friend of Joseph Addison, spent more than a quarter of a century."

The country surrounding Greenway Court was beautiful. The valleys were rich. The sloping meadows were covered with grass so tall that "a man might tie it before him as he sat on horseback." Over these vast spaces roamed herds of deer and elk. In the dense shade of the forests panthers, wildcats, bears and other wild animals lived in abundance. The wilder and more dangerous game—the lurking savage—was constantly in evidence. There were springs and streams everywhere. Fish and birds were as plentiful as anywhere on earth. It was a great place, this new wilderness, for a disappointed bachelor to live—and die.

Despite the fact that he was always a pronounced loyalist, the hospitality and fair and noble qualities of Lord Fairfax caused him to be held in such esteem and veneration that all during the Revolutionary War he was never molested or insulted, and his property was equally respected by Americans and British.

The events of the Revolution were watched with deep interest by the old gentleman. It was difficult for him to believe that his old friend, George Washington, was now the leader of the American forces. When word reached him of the surrender of Cornwallis at Yorktown he was completely overcome. He realized that the war was over and that America was forever severed from Britain. He called his old body-servant, Joe, to assist him to bed, slowly murmuring: "It is time for me to die." And he did.

The Annual Meeting

The Southern Appalachians, land of the Great Smokies, the giant tulip trees, and Cherokee Indian lore, will be the scene of the 56th Annual Meeting of The American Forestry Association, June 3, 4 and 5. It will be held at the Grove Park Inn, at Asheville, North Carolina, jointly with the North Carolina Forestry Association. Watch for the announcement of the program, which will be one of the most enlightening in the history of the Association, and plan now to attend. Reservations may be made by writing The American Forestry Association at Washington.

In the rosewood forests of Brazil.

The Beginning of Forestry in Brazil

By William T. Cox

Organizer of the Brazilian Forest Service

MUCH has been said and written about the great extent and variety of the forests of Brazil. From what has been seen of them, both in the interior and along the coast, and from such meager data as are available it is known that the stands of timber in many parts of Brazil are truly magnificent. It is known, too, that the number of species is almost bewildering and that among the trees of the country are many that produce structural timber and cabinet woods of the highest quality.

For more than 300 years the crowned heads and the aristocracy of Europe have rested on beds made of Brazilian rosewood. The king's tables and the court furniture have been built of rosewood. Other beautiful woods of Brazil have found a market in Europe and have gone into the high-class furniture that Americans so greatly fancy and bring back with them on their return from tours through France, Portugal and Italy. Without a doubt Brazil has the finest hardwoods in the world.

There has been a drain on Brazilian forests, but mainly along the coast where transportation is easy. In the interior great quantities of precious woods remain. Forest destruction of another kind has been much more serious. The old system of clearing and burning forest land for agricultural use has been and is still practiced. This method consists of girdling or cutting down the timber on a tract, burning it over and then planting crops in the ashes. Corn, cotton, sugar cane, rice and mandióca may thus be raised easily for two or three years by which time the sprouts and other native vegetation again take possession of the ground. The farmer moves on to a newly slashed and burned area. This practice would not be so bad if the abandoned fields came up to good species of trees but this is seldom the case. Usually the new forest is a tangled growth of thorny vines and trees of little value. The extent to which this primitive method of agriculture has modified the forests of

William T. Cox, long identified with conservation work in the United States and former State Forester of Minnesota and Superintendent of the Upper Mississippi River Wild Life and Fish Refuge, went into Brazil in 1929 to organize a national forest service for that government. What he has encountered in this rather adventurous undertaking and what has been accomplished are set forth for the first time in this article, prepared especially for American Forests several months ago.

At the time of the recent revolution in Brazil, which brought about a change in government, Mr. Cox was returning from an exploration trip in the upper Amazon country, arriving in Rio de Janeiro in time to see the government overthrown. In a letter to the Editor, dated October 28, 1930, he set forth the highlights of his experiences. He said:

"I surely was lucky to catch that last boat from the Amazon country and get home to the folks when I did. The big events seemed all timed for my trip down the east coast. Things broke first at Pernambuco while I was there and I saw plenty of shooting at close range. I lost my field assistant there. We left the boat and went uptown to see what was going on and when the street shooting became a bit uncomfortable, Souza, my assistant, wisely ducked and, as I learned later, lay hidden for a day or so. He finally reached Rio on a French ship. I made it to the dock all right and caught the S. S. Para, on which I was traveling, before it left the harbor.

"Two days later I reached Bahia while things were popping. Didn't go far from the ship, but saw plenty. Later, as we neared Rio, we were ordered back to Bahia, being told that the city was under bombardment. Several days later we turned south again and entered Rio de Janeiro, not knowing who was in control of the city,

"Then the big show started and it was some performance. It was amusing at times, even during the worst of it, to see how unconcerned some of the American residents were. However, things look well now. The new government is taking hold of the difficult situation in good shape and people have confidence in the new chief and his cabinet."

In the interior of Brazil are great quantities of precious woods. Here the author is inspecting logs of macacanba ready for shipment down the Amazon River.

eastern Brazil is astonishing. Probably more than half of the original forest in that region has been more or less completely destroyed, and yet only a small fraction of the land is used.

One of the first tasks of the Federal Forest Service, that is gradually being organized, is to find out more definitely what the forest conditions are in all the vast regions of Brazil. Up to this time little has been done to ascertain necessary facts from which safe conclusions can be drawn and on which action should be based. Reconnaissance work has been started with the assistance of forest engineers from the United States and the aim is to cover all of the important parts of the country, but first those districts where lumbering is under way or likely to be started and districts where agriculture is being extended by the cutting away of the forests. It is hoped to find out not only what areas are actually forested but approximately how heavy the stands are and of what they consist.

Contrary to an opinion quite generally held, the Forest Service has found that many areas carry timber trees of only a few species and most of these are of recognized commercial value. Such facts are of immense importance, of course, where lumbering operations are contemplated. The old idea that tropical forests are all jungle and pretty much alike must be discarded in Brazil. One constantly sees new types and stands differing widely in composition. Some are open, some dense, some appear almost artificial in their two-storied character. Occasionally over large areas one finds the most pleasing mixture of palms and hardwoods with sunlight streaming through to the mossy floor. In such places one would scarcely be surprised to see a band of brownies or fairies troop out to gambol among the smooth, scaly, or fluted tree trunks.

There is wide divergence in the practices and standards of the timber operators in Brazil. It is going to be difficult but necessary to bring about greater uniformity in milling, in the rules for measurement, in nomenclature and in grades. In other words, when an order is placed with a lumber company one should be sure of what he is going to get. The lack of such security has been responsible for holding back an industry that has every reason to develop rapidly.

Then there is the task of building up a trained force of young Brazilians to continue and enlarge the forest work when it gets under way. That this is going to be difficult may be inferred from the fact that there is no word or group of words in Portuguese, the language of Brazil, that conveys the idea of forestry. Tree planting alone of all the branches of forestry is understood here and some excellent and extensive work has been done in the planting of eucalyptus. The great plantations planned and established by Dr. Navarro de Andrade for the Paulista Railroad con-

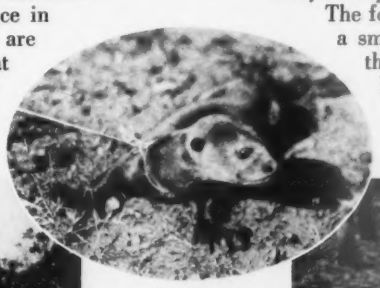
Hardwood timber of valuable species in the state of Para which often exceeds 50,000 feet an acre. Brazil has the finest hardwoods in the world.

stitute a record accomplishment in this line. Tree planting is important in the drier portion of the country and on mountain slopes that have been denuded with disastrous results.

Young men are being selected to be sent to North American forest schools and it is hoped soon to obtain trained men for teachers at some of the agricultural colleges of Brazil.

Through the Tropical Plant Research Foundation there is cooperation with various agencies in the United States. Yale University is aiding in the matter of identification and classification of woods. The United States Forest Service and the University of Michigan are giving helpful advice and the latter active assistance in the conduct of timber tests. Shipments of logs are sent to the States to be cut up and timber thoroughly tested. Later on it is hoped to have a laboratory equipped to do such work in Brazil and so obviate the necessity for expensive shipments of logs.

The reconnaissance survey will provide data on which to base recommendations for the creation of national or state forests and parks. It is evident that the matter of protection forests is of vital importance in many parts of Brazil. Then, too, there are tracts of peculiar beauty and interest that may well be made national parks and playgrounds and even sanctuaries for desirable and vanishing species of wild life.



Brazilian wild life. *Left,* Arara parrots. *Above,* a young otter of the Amazon, captured alive. *Right,* an Amazonian crocodile and the Para Indian who killed it.

Parts of Brazil are destined to become popular with a certain class of travelers who wish to see unspoiled tropical wilderness. There are great districts possessing a salubrious climate, extraordinary beauty, abundant game, gorgeous displays of bird life and the most primitive conditions where interesting Indians of several tribes wear little except a plug in the lip and a smile. Sometimes this latter is a scowl but the territories inhabited by dangerous tribes are known and need not be visited.

In England and in Europe generally there has long been a wide choice in the selection of wood for furniture, paneling and similar purposes. They have had the best North America could produce as well as woods from all parts of the world. The United States has clung pretty closely to its native species for all purposes. This is not surprising because originally there was a fine lot of woods to choose from. Black walnut is a wonderfully beautiful cabinet wood. So were black cherry, curly and bird's-eye maple. The oaks provide good material of dignified appearance. Yellow birch and gum are good in quality and pleasing in tone.

While it is well to favor home products within reason, there are good grounds for the bringing in of certain woods from foreign countries. For instance, the United States welcomes the importation of pulp wood from Canada. Similarly it would seem that choice cabinet woods and perhaps railroad ties might well be imported to help out the gradually waning supply of home-grown timber.

The American home builder and furnisher is entitled to a choice of the best there is. He is going to have such a choice. If he cannot find what he wants in the mills and stores at home he will go to Europe and buy there even though he may have to pay heavy duties. It seems, therefore, that the American factories making furniture and similar products may as well recognize this fact and arrange to bring in, as a few of them have been doing, some of the very best woods to be found in the world. This would bring buyers to Brazil, for here are the choicest woods.

It is an intensely interesting job finding out what Brazil should do in forestry. In visiting the different forest regions in the twenty states of this great republic one must travel through a vast extent of territory, for Brazil is larger than the United States without Alaska. On each trip one is impressed with the tremendous areas of good country still lying absolutely unused, much of it scarcely known or entirely unexplored.

The forty million people of Brazil occupy only a small part of the country, mostly close to the Atlantic Ocean. The healthful highlands of the interior for the most part are without white inhabitants. The Indian population is not great. Fertile lands for agriculture, rich grass lands for stock, wide belts of choice timber, mountains, plains and splendid rivers all await the coming of transportation, settlement and development.

It is like the West of America must have been in the days of Lewis and Clark. The rivers teem with choice fish many of them of the salmon type suitable for canning. Game is plentiful; so are fur-bearing animals.

The forests are already producing a considerable amount of timber, mostly for home consumption and to supply Uruguay and Argentina. Much of the timber cut is from the Paraná pine belt where modern sawmills operate on a large scale. Some of the hardwood mills are modern, also, and are well run by Brazilian superintendents and crews.

By-products of the forest constitute no small item in the commerce of Brazil. Among these are rubber, tea, nuts, oils, fibers and furs. There are wonderful opportunities for the development of enormously increased traffic in some of these products. And such development will tend to improve transportation facilities and in other ways better the opportunities for getting out and marketing timber. It will thus become more feasible to log with greater profit and to devote a part of the proceeds to the regulation of cutting and other measures that will enable Brazil to perpetuate her splendid forests.

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The Washington Elm at Cambridge, Massachusetts, as it appeared late in the Nineteenth Century.

A New Washington Elm

By Heister Dean Guie

WHEN the famed Washington Elm of Cambridge, Massachusetts, succumbed to old age and disease in October, 1923, few persons were aware that it bequeathed to posterity a pedigreed scion the breadth of the continent away, on the University of Washington campus in Seattle.

Now the historic tree can be replaced by a direct descendant from the Pacific Northwest. A sturdy sapling, propagated from a limb of the Seattle elm and set out last April in the University's botanical gardens, will be shipped to Cambridge whenever the park department of that city is ready to receive it. This stripling heir is literally a "chip off the old block". Its leaf structure is identical with that of the original elm, under which, tradition says, George Washington assumed command of the Continental Army in 1775. But for Arthur J. Collins, of Spokane, high school teacher and alumnus of the University of Washington, the latter institution would have had neither its prized second generation scion nor the third generation tree selected for this restoration. Thirty years ago, Mr. Collins obtained the scion that graces the grounds of the University. How he did it perhaps can best be told in his own words.

By fitting a moss and earth filled box around a branch of the University of Washington elm, the "cutting" for the new Washington elm was propagated. It is the one on the right.

"I first saw the Washington Elm in 1898, a short time after entering Harvard Graduate School," Mr. Collins said. "I regarded the elm as the most historic tree in America and, while studying it closely that afternoon, the thought suddenly came to me that it would be a great thing to have a scion of that old tree growing on the campus of my alma mater on the Pacific Coast. I made inquiries as to how the end desired might be realized,

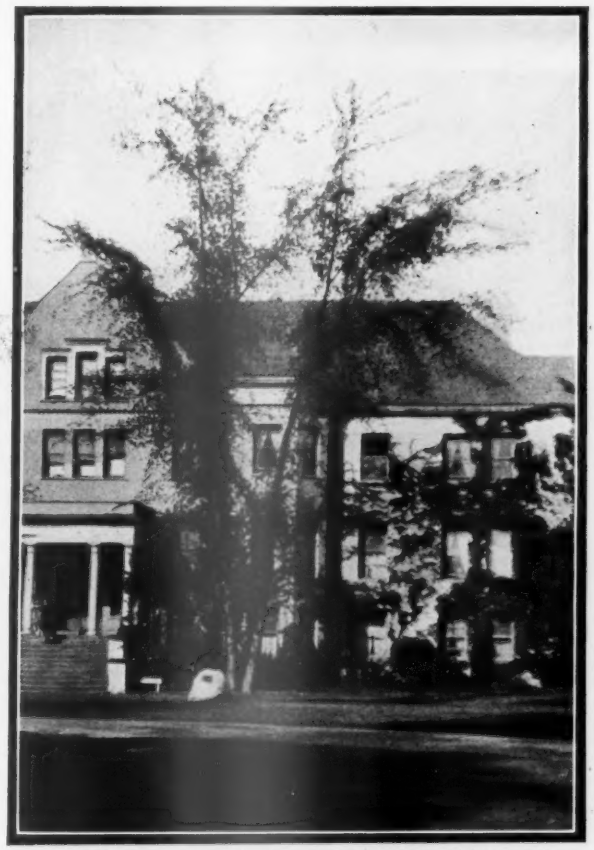
and set to work on what a number of botanists said could not be done with such an old tree.

"The realization of my wish required considerable work and patience and a little expense. The first step was to get permission of the Cambridge Park Commission and the City Council. This required several trips to the city hall and explanations galore. When I had convinced the Council there was nothing of a mercenary character in my motive, consent came quickly and the Park Commission gave every assistance.

"The superintendent of parks went with me to the Washington Elm in the latter part of January, 1900, and again early in April. Each time he cut three small branches, from which about fifty slips were taken. The Harvard Botanic Gardens and the Arnold Arboretum used several methods with slips from both cuttings in their propagation rooms, the latter succeeding in getting a healthy growth from one slip that had twelve leaves by May. Several slips were made of this and three or four little trees were grown. In March, 1902, I expressed two of them to Professor Edmond S. Meany at the University of Washington."

Professor Meany, noted historian, planted the trees on the campus. He remembers that they were not more than four feet high at the time. Set close together, in the same hole, they developed twin-fashion and now are regarded as one tree. Its beauty and grace is attested by the photograph shown at the right. Affidavits from the Harvard Botanic Gardens, the Arnold Arboretum and Cambridge Park officials, attesting the genuineness of the scions, are in Professor Meany's possession.

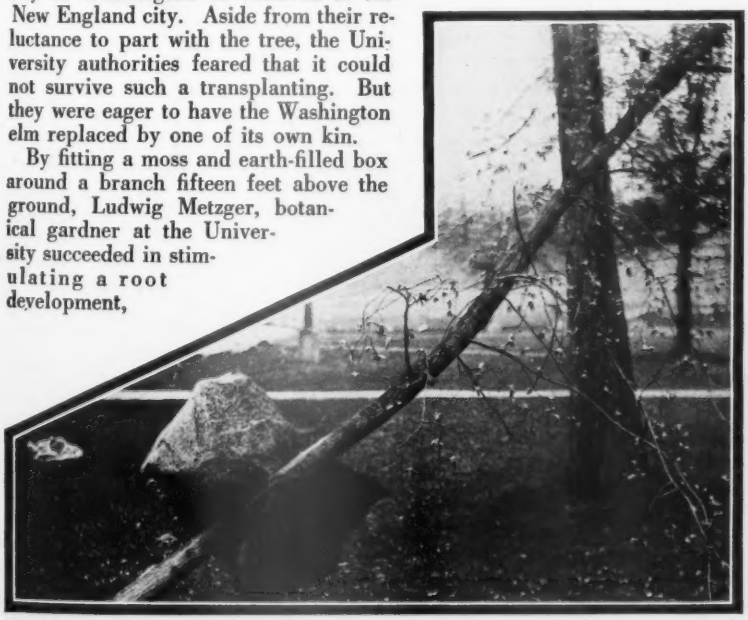
Of the other one or two slips successfully propagated at that time no record exists today, so far as Mr. Collins and Professor Meany have been able to ascertain, although there is a small elm, a direct descendant of the Cambridge tree, growing in the Arnold Arboretum. There are two other direct descendants, a fine, large tree in Wellesley, Massachusetts, and another on the estate of Dr. J. L. Goodale at Ipswich, Massachusetts.



The "Washington Elm," scion of the Cambridge Elm, on the campus of the University of Washington, at Seattle.

The attempt to provide Cambridge with a "grand-scion" of its famous tree was undertaken following a suggestion several years ago that the elm on the campus of the University of Washington be removed to the New England city. Aside from their reluctance to part with the tree, the University authorities feared that it could not survive such a transplanting. But they were eager to have the Washington elm replaced by one of its own kin.

By fitting a moss and earth-filled box around a branch fifteen feet above the ground, Ludwig Metzger, botanical gardner at the University succeeded in stimulating a root development, and thus procured the desired cutting. To reduce the chance of failure, Mr. Metzger placed two boxes in the tree, where they were left from March 3, 1928, to April 23, 1930. He hoped that the arrangement would induce at least one of several switches to take root. Quite unexpectedly, one of the largest limbs rooted as well, and it was this branch that was chosen to become the new "Washington Elm."



Branch of the University of Washington's elm selected to replace the famous Cambridge Elm. Note how root growth was induced in mid-air.

Severed from the parent stem and planted to await transportation East, it stands fourteen feet high, vigorous and shapely, well worthy to carry the name of its illustrious grandsire.

That the great old Cambridge tree should be replaced is important—doubly so when there is a direct descendant to carry its fame down through coming generations. Not only is the scene that was enacted under its great branches in those stirring days of the Revolution among the most sacred in American history, but it is significant of one of George Washington's most cherished characteristics, his deep regard for trees. If the scion of the Cambridge Elm can give reality to this historic incident in future years, and perhaps another sapling from its own limbs to carry on, there is little fear that the famed tree of Cambridge will be forgotten.

In Moritzburg Forest, the hunting castle of the kings of Saxony has stood for four hundred years.

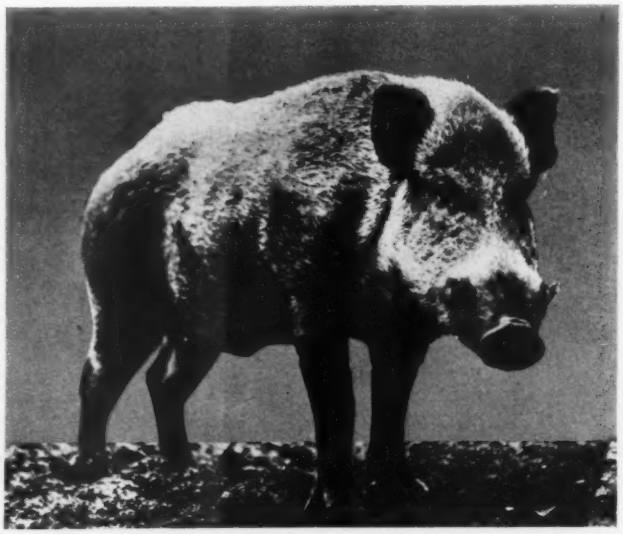
A Wild Boar Forest of Northern Germany

By Edward C. M. Richards

DR. VON MONROY was seated at his desk in his attractive Berlin office listening to my proposed plans for studying some of the outstanding examples of coordinated game management and forestry in Germany. As I developed my ideas his interest became visible and finally out popped the question, "Would you like to visit a forest specializing in wild boars?"

"Would I like to? I should say so," I replied.

Dr. von Monroy is a most interesting character. He has the pep and punch and decisive action of the best American executive and combined with it the proverbial thoroughness, accuracy and exactness which has made the German nation famous for its lenses, its *Graf Zeppelin*, its chemical industry and its forest management. Without a moment's delay he reached for the telephone and put in a long-distance call for Forstmeister Maske at the Oberförsterei Springe, some 320 kilometers to the southwest of Berlin, and on getting the connection, completed all the arrangements for my visit. Evidently the foresters of the Fatherland were right on the job. Everything was ready. It was now up to me to do my part in getting out to Springe on the following day with my camera, movie outfit, notebook and interpreter. Shortly after an early breakfast the next morning I found myself rolling out of Berlin with my interpreter, Herr von Hamm, in my Ford sedan, with the photographic equipment and our bags in the rear of the car. As we passed through the Brandenburg Tor, slipped through the Tiergarten and Charlottenburg and straightened out at a faster clip for Brandenburg and the west, where Hanover and Springe awaited us, the loveliness of our journey began to dawn upon me. The highway was paved beautifully with small hewn stones about four inches square, set so perfectly that the surface of the road was nearly as smooth as concrete, while the many small cracks between the stones gave the tires excellent traction on curves even when the road was wet. Along each side of the road ran a continuous row of apple trees, efficiently p r u n e d and now, in early spring, covered with lovely white blossoms. The trees belong to the towns and villages, are cared for by them and the fruit is auctioned off each year, the money going into the town treasury. Astonishing, but truly German—to supply hundreds of miles of country road with good shade trees which not only produce shade



A large wild boar—an unusual specimen of the kind that has furnished royal sport from an age long past.

but also lovely white blossoms and then fruit at a profit to the community! How much better the roads of America could be handled!

On both sides the peasants were out in force with their early planting and a number of things caught my eye. First of all, the entire countryside was being utilized. Not a square foot was being wasted or allowed to lie idle. The farming, on the better soils, came right up to the edge of the road, the crops being planted in blocks or strips without any fencing of any kind, thus saving a great deal of space and incidentally making the landscape quite different from anything in America because it gave the appearance of being one great field all beautifully cultivated. Every now and then the road would pass over a low sandy hill or dry soil area where agriculture would not pay and here we passed through carefully planted and thinned forests of Scotch pine of various ages. Nowhere was there land waste. There were no brambly fence corners, no abandoned fields partly grown up to scrubby trees and brush, no cut-over-and-burned forest land. Every hectare of the whole country was either in use for towns, cities, roads, railroads, or in farm crops or fine well-cared-for forests.

And yet another thing which caught the eye was the primitiveness of the methods used on the fields. Most of the animal power was cow power—not ox or horse power, but cow power—and no tractors appeared at all, for Germany is desperately poor and cows must work at the plow as well as give milk. Nevertheless the country was being cultivated as thoroughly as some of our truck gardens in America in spite of these handicaps. There were no country houses or dwellings—only towns and villages—with the open country between. As there were very few cars or other vehicles on the road, I stepped on the gas and we flew over the country at fifty, fifty-five and even sixty miles an hour on the straight open stretches. The sun shown brightly, the apple blossoms lined our path and the early green of the grass made our ride altogether delightful. All day of such travel, with a good lunch in the sunshine at a table outdoors in front of an inn, and interesting conversation with von Hamm about our mutual experiences in Persia during the Great War, made the day one to be remembered. When toward evening we drew into the Oberförsterei at Springe and found Forstmeister Maske waiting to welcome us, it was with a feeling of satisfaction and contentment for the day just passed and of keen anticipation for what was to come that I went to the village inn and secured our rooms.

As soon as our accommodations were arranged for the night I took the movie outfit and the still camera and getting into the car with von Hamm, ran back again to the Oberförsterei where Forstmeister Maske was waiting to take us to see the feeding of the wild boars. This was not far away so we walked, leaving the car at the house, but carrying the photographic outfit with us. And so almost immediately after arrival I had my first introduction to the famous wild boar forest of the Hanoverian kings, the Saupark of Springe.

At the boars' feeding grounds a forest ranger, in his gray uniform and green hat, and with a large burlap sack of Indian corn, walks around in circles allowing a thin stream of corn to fall upon the ground.

About one hundred years ago the King of Hanover, in northwestern Germany, decided to establish for himself, close to the city of Hanover, a hunting preserve for wild boars. In some ways this offered no particular difficulties, but one important fact relative to this "black game" called for real study and adaptation if such a *saupark* was to be a success. This particular fact is that wild boars are capable of doing an immense amount of damage to farmers' crops. Therefore if any large stand of boars was established in a forest, something would have to be done to protect the neighboring farm from inroads by the animals, or serious trouble would develop. After careful consideration it was decided that the best solution was to construct a solid, wet-mortared stone wall completely around approximately 4,000 acres, a large enough area to furnish adequate space for the proposed herds of boars. This therefore was done and today, in spite of all the intervening years with the wear and tear of the weather, one of the things which first impresses the visitor at Springe is this ancient stone wall, still solid, still unbroken and still effectively holding all of the game within and protecting all of the fields without itself.

The kings of Hanover have passed into history. Germany has become a republic. The ideas of the world in regard to

kings, to wild boars and to forests have undergone many changes, but the visitor cannot help being impressed as his eye follows this interesting relic of a past age as it winds through the forest, up hill and down dale, over hills, across streams, stretching through the forest on the flats and lower slopes as far as the eye can see, always ancient in appearance, often green with moss, but still doing its work effectively and well. And when the visiting forester learns a bit more about the *Saupark* his interest is intensified for he then begins to realize that these miles and miles of green wall contain not only some interesting specimens of royal sport from an age long past but also some facts of keen interest to the alert forester of 1931—and perhaps some facts which may be worthy of consideration for parts of the United States of America—at least in modified form.

A stand of pure beech trees in the wild-boar region of Germany. The beech nuts provided good food for the "black game" of the Hanoverian kings.

The area of that part of the Oberförsterei Springe enclosed by the stone wall is on the fairly moderate slopes of some hills and ridges just south of the town of Springe. These hills and ridges are not particularly striking in appearance and rise not more than 400 meters above the general level of the open farm country surrounding the village. In the long-distant past a castle used to grace the summit of the chief of these ridges, but this is now in ruins and from below near the house occupied by Forstmeister Maske nothing can be seen of it because of the heavy forest growth which now covers the slopes from top to bottom. The country is not rugged and there are no rocky peaks or cliffs visible, although some of the slopes are steep. The public road runs south from the town past open farmland for about a mile and a quarter to the Forstmeister's home at the edge of the forest. It enters the stone wall enclosure at that point, turns eastward and runs along the slope of the hill in that direction through splendid stands of hardwood timber—largely beech—until after a couple of miles another entrance is reached. Here it passes out into the farm country beyond the Saupark. The public road passes through the Saupark over an almost level route, the great bulk of the walled-in enclosure lying on the steeper, upper slopes to the south. In other words the road cuts through a small section of the park, entering and leaving the enclosure through gates in the wall, but keeping to the lower elevation of the park. And this brings out one of the interesting little details of game management which would not be thought of in conversation but which comes out in strong relief when one runs across it in the field. What strikes the attention on leaving the home of the forstmeister and entering the Saupark itself through one of these gates in the wall, is the fact that the way through is entirely open and unobstructed, there being no doors, no swinging, folding or lifting gates—nothing, apparently, to prevent the game from walking right out of the open passage through the high walls. There are gate houses close to the gates, but the game could run past and gain the outside without hindrance. The question at once arises in the mind of the visitor, "What keeps the game from running away—especially at night?" I did not learn what the answer to this question was until that evening after supper. Then our host took us out himself and explained the entire system in detail, showing how to close a gate to game at night, while leaving it open to automobiles, horse traffic and human beings. Here is how it was done.

Wild game! Though they appear docile while feeding, the wild boar of Germany's forests are astonishingly alert and active and, when wounded or cornered, viciously savage.

Starting at the gate or opening in the stone wall, two good stout wire fences ran back, one on each side of the road, and close to it, for perhaps 150 feet into the Saupark. At the end of the fence on the left side of the road was placed a small wire enclosure about ten feet square, with a small door in one side. Directly opposite this enclosure, at the end of the other fence, on top of a strong wooden post about ten feet high, a powerful incandescent electric light was

fixed, set in a good reflector. It was so placed that all of the light was thrown down on the road, but away from the entrance through the stone wall, which was some 150 feet back, behind the ends of the wire fences and the electric light pole. That was all, except for two very playful fox terriers which kept frisking about us in the forstmeister's home during daylight hours but which were secured by leashes as dusk fell, led out, and placed in the small wire enclosure at the end of the wire fence on the left side of the road. This having been done, the electric light was turned on, and the gate was closed, at least to game, until morning came.

The European aurochs.

The result of this procedure will best be appreciated by putting oneself in the place of a boar or deer which wished to get out of the Saupark through the gate in the stone wall. If an attempt was made to follow closely along the wall itself, game on reaching the gate ran against the stout wire fence, which, if followed, would turn it back into the park. If, on the other hand, the game came toward the gate on or along the road itself, as it approached the opening between the two ends of the wire fences, it was blinded by the intense light shining directly into its eyes. This caused everything behind the light itself to appear lost in dense darkness, while if the game persisted in advancing toward the opening through which the road ran, it walked right out into plain view of the two lively fox terriers caged close under the light. Needless to say these animals lost no time in sounding the alarm.

If by chance the dogs were asleep and the game sneaked up so quietly as not to awaken them, the fact that the nearer it got to the light the more exposed to view it became, would tend to prevent it from advancing all of the way through the lighted area, which it would have to do in order to enter the narrow opening between the two wire fences along the road. Even if the light itself went out while the dogs slept, the game would have to strike the narrow opening through which the road passed and follow it for 150 feet back to the gate in the stone wall before it could get out of the park, a thing which would be fairly difficult. Altogether, the device struck me as being simple, inexpensive, very effective and quite worth remembering.

Our little group walked through the gate, past the wire fences and the electric light pole and proceeded some distance down the public road. On all sides rose a splendid stand of beech timber, the trees often being twenty inches or more in diameter, with exceedingly long, straight boles, clear of all branches for sometimes forty feet or more from the ground. The canopy of the tree crowns above being dense, the forest floor was heavily shaded and little or no underbrush existed so that the forest was parklike and very impressive in its cathedral-like beauty. It did not show signs of human activity however, there being no stumps or other indication of the presence of man, a thing which was a surprise, as the Saupark has been under forest management for generations.

After going along the public road through this beautiful forest for a quarter of a mile or more, we turned off to the right, up a fairly steep grade and followed a rough footpath some hundred meters or so until we came to a group of unusually large beech trees under which the soil had been trampled by many cloven feet of all sizes. This was one of the boars' feeding grounds and I got my photographic and movie equipment in readiness for whatever might happen. I did not have long to wait. Almost at once a forest ranger appeared in his gray uniform and green hat and carrying on his shoulder a large burlap sack of Indian corn. When he got to the feeding ground he began to walk about in circles at the same time untying the mouth of the sack and allowing a thin stream of corn to fall to the ground. Almost at once Forstmeister Maske, who had been searching the nearby forest with his eyes for our quarry, seized my arm and pointed to the edge of a small clearing where denser, younger growth gave the animals more shelter, and sure enough there were my wild boars.

I will always remember my first impressions of them. They appeared to be almost coal black, unexpectedly small and so closely bunched and so many of them together that I could not count their number easily. They also were evidently shy of so many visitors and in spite of the food being scattered before their eyes, they did not come in for it at once but milled around excitedly. As we remained very quiet, however, this fear gradually left them and they came closer and closer until some of the boldest ones approached to within fifty feet or so of me and I could get an excellent look at them. Then I noted that their apparent coal-black color was really a dark brown and that on some of the larger animals this was slightly streaked with gray. In height, they stood anywhere up to about two feet at the shoulders and their shape was

Only fifty-six pure-blooded aurochsen, akin to the American bison, carefully guarded and bred, now remain in all of Europe.

not unlike our Southern razorback hogs. But—make no mistake—these beasts were no tame pigs. That was evident at once. They were wild game. They were not at all domesticated and this was impressed upon me very much by the following points: First of all, they were astonishingly alert and active—as quick or even quicker on their feet than a collie dog in the pink of condition. When they ran, I was astonished at how rapidly they got away, how easily they turned, jumped ditches or rough spots and how graceful was every movement. Their long hair added to their wild appearance and the fact that they never stood still for more than a second or two showed that they had the wild animal's appreciation of the fact that the price of liberty is constant vigilance.

One thing about them surprised me—their small size. The largest evidently did not weigh over 150 or 200 pounds. But on speaking of this, I learned that all of the boars before me were youngsters—not over one or two years old. The big boys and old-timers were an entirely different brand of beast. These latter could never be coaxed down to a feeding ground near a road, especially when anyone was near. They ranged the wildest and most secluded parts of the forest, the old males in solitary grandeur, ugly in temper, fiery of eye, long of tusk and dangerous to attack. These great chieftains of the boar clans were all that could be desired in the way of size, ranging up to three and one-half feet in height at the shoulders and weighing up to six hundred pounds of wiry, active, concentrated energy. They are not a beast to fool with, and they furnish excitement in the way of hunting second to no other European game. If wounded, they will charge and woe to the man who fails to avoid that charge. The tusks, often four inches long, are capable of inflicting terrible wounds.

Next morning found us in the private study of Forstmeister Maske and it was a real tribute to the patience and generosity of my host to see how he withstood my barrage of questions. For I had come to Germany not just to see wild boars and get pictures of these interesting animals. I was interested in much more than that. I wanted to know about the place of these animals in the practice of forest management; whether they are a liability or an asset to the forest; if so why and how much in dollars and marks per acre and per year; how many boars of what ages should be kept per unit of forest area; what the annual boar increment is; what the annual kill should be; how the boars injure the forest and how they help it, and so on, during a long morning. And through it all, Forstmeister Maske sat there cordial, friendly and patient. It made me feel uncomfortable. The more I asked, the more I learned, urged on by the possibility of making some application of it all to conditions in the forests of the United States. Here are a few of the interesting facts which he gave me.

That portion of the Oberförsterei Springe within the stone wall was the most profitable forest area per acre in the whole region and this was due to the presence of the boars. Kept under careful control as to numbers, they continually dig up the forest soil, eat out the chrysalises of insects and mix the leaf and twig litter with the soil. Such treatment corresponds to the cultivating of a crop of vegetables. It enriches the soil and so increases the growing capacity of the forest. Just after the revolution, orders came to kill all of the boars as there was no money to feed them. But Forstmeister Maske knew their value, so he went around to everyone he thought could help, and raised enough to keep the animals alive. Today it is acknowledged that from the dollars-and-cents standpoint alone the boars are a great asset to the forest. It is estimated that if they were removed, the total net income of the forest would be reduced some 36,000 marks a year, to say nothing of the loss of some 5,000 marks more received from the sale of hides and meat. And this in spite of it costing some 8,000 marks a year to feed the animals. Today all of the sport of hunting goes to the forestry staff and so returns no income. But, undoubtedly, a judicious system of hunting permits could be sold to a limited number of people with good financial benefit if the forestry staff wished to do so.

Surely the results of coordinated wild boar and forest management at Springe is worthy of consideration here in America. The wild boar is a really sporting proposition, as a game animal, and when understood and handled properly by those who know its particular needs it can be made to enhance the condition of the soil and increase the rate of growth of the forest. With the thoroughly efficient hog-proof fences that can be bought here in America, why cannot wild-boar forests be profitably established on some of our large hunting club areas, and perhaps later on some of our public forests and game preserves? They can be so handled as to furnish good sport, good food, good forests and good profits. The possibility of introducing wild boars into some of our forest areas here in America is worthy of serious consideration both by American sportsmen and by American foresters.

Before the War the Kaiser used to come to Springe for a boar hunt now and then. To care for him a large and substantial stone building or hunting lodge was erected and a long, straight avenue lined with fine maple trees was laid out, running from this lodge down to the railroad, some two kilometers away. But when Germany became a Republic, this property was taken over by the State and today the former hunting lodge is used as a vacation school for the poor children of the city of Hanover.

Still another matter of interest is the aurochs enclosure. Here, well protected by heavy double fences, the Forestry Department has a small herd of the famous European aurochsen, which are being carefully guarded and bred. Only fifty-six pure-blooded aurochsen now remain in all of Europe and only one such pure-blooded animal is found at Springe. These beasts are so rare and so closely akin to our North American bison that a program has been determined upon—using the pure bloods as breeders and by repeating the cross with the American bison—of gradually building up a herd with an ever-diminishing percentage of bison blood and an ever-increasing percentage of aurochs blood. In a general way the aurochs might easily be mistaken for an unusually large, deep-chested bison, but on closer examination, especially of the head, as shown in the accompanying photographs taken at Springe, a distinction is noticeable.

Forest Flashes from the South

Hand-Planted Forests

By W. R. Mattoon

Above—The Boy Scouts of Macon, Georgia, had some old, worn-out fields on their 6-acre Camp, Al-Sihah. So they proceeded to sow seed in "spots" and plant yearling slash pines. The pictures shown above tell the story of the excellent results from both kinds of hand-made reforestation.

Left—Perhaps the oldest planted forest in Dixieland was established by Seaton Grantland, a farmer of Griffin, Georgia, back about 1893. He reforested ten acres of wornout farm land with about 8,000 baby shortleaf pines. The woods now consist of curving rows of stately trees, as shown in the picture.

Four thousand acres of this denuded cut-over land in Louisiana were planted in the spring of 1925 with one-year slash pine seedlings. The owners, the Great Southern Lumber Company, have reforested nearly 20,000 acres, mostly in longleaf and slash pines, and are keeping up the rate of about 5,000 acres yearly,—an enviable record indeed.

North Carolina lays claims to having the oldest planted forest in the South. This grove of shortleaf pines was set out on one acre between 1890 and 1895 by W. F. Vestal, a farmer of Snow Camp, Alamance County. Surrounding the grave of his wife, the trees have grown in stately beauty into a real memorial forest.

"MARCHE! MARCHE!"

Racing the Snow Trails

By Earle W. Gage

"*MARCHE! MARCHE!*" cried the French-Canadian driver to his dog team as he struggled toward the finish tape.

But he had a slim chance of winning this 120-mile dog derby over the trackless forest wilderness of the North in the 1930 classic. Just ahead were two of the world's most famous and experienced mushers of snow trails—Leonard Hard Sappala, American hero, who, several years ago, blinded by an Arctic blizzard, had carried diphtheria serum to stricken Nome, and Emile St. Godard, Manitoba youth, only racer to wear the world's championship crown four times.

Among the dozen or more teams strung along the trail were the most famous drivers and dogs in the world—men who have written thrilling chapters into the romantic story of the North, dogs that have demonstrated their prowess and skill on thousands of miles of lonely trail.

Lining the streets of historic Quebec, where the International Dog Derby was being held, were thousands of thrilled spectators, who sent up a mighty cheer as St. Godard's lead dog, Toby, broke the tape.

St. Godard finished the course, run in three forty-mile laps, in the record time of eleven hours, one minute and twenty-seven seconds, beating the record previously held by Sappala by five minutes. But the American was not so downhearted as one might imagine. He had cut six seconds off his own record!

The husky—faithful friend of Snowland.

Clinging to Sappala's heels was Hector Chevrette, of Quebec, who placed third, and behind follow such famous racers as Brydges, Lefond, Dupius, the 1924 world champion, and others.

Many of these thrilling sporting events will take place during February and March of this year, over wild and trackless snow trails.

Although large cash prizes and coveted cups are awarded the winners, the real glory of the races is in owning a superior string of sled dogs. This honor is prized by the sourdoughs of the snow trail more than glittering gold or sparkling trophies. The drivers are men of great endurance, but the determining factor is the quality and power of the dog team. The husky dog is a hardy, sagacious animal of wonderful endurance, inured through generations to the climate of the bleak Arctic, and the ardors of the snow country. He is a tremendous worker, all-enduring, and not infrequently is made up of "too-many-kinds-of-a-dog" to have his family tree too closely investigated. His veins may carry blood of the mastiff, German police, wolfhound, setter, spaniel, collie, or even a little of all. Though his lineage be badly mixed, his mileage speaks for itself.

Man boasts that airplanes and snow-motors have conquered the vast empire north of sixty degrees, yet man continues to depend for weeks on end upon the diligent and faithful dog team to get about. For the dog team is the only dependable means of transportation and communication over a territory as large as the United States, and more often than not leads a rescue party to the air pilot whose plane has broken to pieces in the heart of the wilderness. Weighing between seventy-five and one hundred pounds, the sled dogs are trained for their work just as soon as they are able to walk. They soon acquire the habit of pulling, running and racing. A good trainer and driver knows and understands his dogs, calls them by name, and, in short, treats them very much like children.

Emile St. Godard, most famous of racers, uses an old automobile chassis to keep his string of dogs in trim during the season when there is no snow on the ground. Dragging an old motor-car frame over the rough trails of the north keeps the team in excellent condition for the long grind of winter.

The method of driving the dogs is unique and interesting. The animals are trained to respond to the slightest inflection of voice of their master. A whip is seldom used; in fact Sappala never carries a whip. The lead dog is especially trained and acts as a real leader. Instead of urging the team to "Go!" the driver exclaims, "*Marche!*" if he be French-Canadian, or "Mush-you!" if he be Canadian or American. "*Yaw!*" means go to the right if uttered by a French-Canadian, and "*Euh!*" to the left. "*Ho!*" means stop.

The Eskimo and Indian are the least loquacious of all drivers, their commands being especially expressive. In the Eskimo's queer, gutteral tongue, "*Ouk*" means turn to the right, "*Ra!*" means to the left, "*Huit!*" to go straight ahead, and "*Ah!*" to stop.

Racers who have participated over the famous courses all the way from the snow-capped Sierras to the northern fringe of Canada, gather at old Quebec where they race in three heats, of forty miles each, three days being required to run the one hundred twenty miles. Each daily grind is a picturesque strife, so the big international event is really three

races in one, climaxed by the championship of the last day.

In addition to the speed and time prize, an award is made to the driver whose dogs break the finish tape in the best condition. In 1929 Sappala had the distinction of winning both prizes, an unusual tribute to any driver.

Besides the 200-mile speed race, an eighty-mile race for freight dog teams is held. This is run in two daily laps of forty miles each and each team carries 100 pounds of freight. This contest permits the heavier plodders of the trail to demonstrate their ability in carrying cargoes of supplies to the settlers located at remote spots in the Northland.

The first dog derby was held at Nome, Alaska, in 1908. "Lawyer" Albert Fink, prospector and lover of the husky dog, raised $10,000 to be awarded winners in a race over a 408-mile course between Nome and Candle Creek, and back. Assisted by a large company of friends, he spread word throughout the North, with the result that a long string of dogs and experienced mushers were on hand. The race was won by John Hegness, who ran the 408 miles across the bleak tundra wilderness, traveling night and day, in 119 hours and fifteen minutes, despite the fact that nearly all the way he faced one of the most ferocious blizzards in the history of the North. It was a mighty achievement, and Hegness wrote his name into the imperishable story of the North.

When the race is run the gallant leader, strong-hearted, iron-sinewed and faithful, takes a much-needed rest.

Into the arena of the second race stepped a young hardware clerk whose name was destined, in later years, to occupy a romantic place in the annals of Alaska. "Scotty" Allen, in odd hours, had managed to assemble a team of dogs of doubtful value as racers. Some light was made of the fact that he had the temerity to list them, yet Allen won the 1909 classic. In 1910 he was defeated by "Iron Man" John Johnson, who established a record never duplicated, running the 408 miles in seventy-four hours and fourteen minutes, the fastest time ever made in any dog race.

"Scotty" Allen came back in 1911, beating his previous record by two hours. He is the only man who ran in more than four all-Alaskan sweepstakes—the first, second, third and eighth and final race. He achieved the distinction of always finishing a race which he entered, irrespective of weather. In 1915 he took 440 Alaskan husky dogs to France, and for distinction in war service he was awarded the coveted *Croix de Guerre*.

Because of his uncanny knowledge of the ice and snow wastes of the forbidden hinterlands, Allen succeeded where others failed or perished. Miner, musher, railroad builder, sportsman, friend of Amundsen, Stefannson and Byrd, "Scotty" Allen has written his name into the records of the North. With Walter Goyne, another famous musher, he perfected the Alaskan "gang hitch," which revolutionized dog racing, and which is standard to this day.

The World War so depleted men and dogs in the Northland that this great classic of 408 white miles is no more. The last race was run in 1916. The following year, however, a company of hearty men assembled at The Pas, Manitoba, then the jumping-off place at the end of the Canadian National Railway, and talked of dogs and races. As a consequence a 150-mile course was agreed upon from The Pas to Flin Flon, a mushroom mining town, and the first race was held. The drivers were for the most part unskilled and the dogs ordinary. There was but $500 in prizes for the winners and nothing for the losers. Accidents marred the race, but the spirit was born, and every February since that time The Pas has staged the most thrilling dog races in the world, and developed some of the most famous drivers and dogs in the sport, among them Emile St. Godard.

The husky dog, more than anything else, epitomizes the life of the North. In that great white region where there are no shining steel rails or smooth macadam highways, and where even a dim trail in the snow is a joy, the story of the husky dog is wrapped up in the country.

From start to finish it is a story of romantic adventure, of strong-hearted, iron-sinewed, faithful companions. In the great saga, Balto, Jerry, Mike, Carlos, Mounty, Prince, and a thousand others stir the heart and dim the eye. To such stout hearts is the dog derby dedicated.

Endurance and courage in both man and dog have set an amazing speed record over the trackless snow trails of the North—four hundred and eight miles in seventy-four hours and fourteen minutes.

Forestry and the Economic Crisis

By Raphael Zon

"The Greatest Moving Force in the Entire World is Energy, and it Must Come Eventually from the Green Plants and, Above All, from the Forest as the Highest Expression of Plant Life.

"If Ninety per cent of Our People are Going to Live in the Big Cities and Only Ten per cent on the Land, There is a Great Peril to Life and to the Quality of Future Citizenship.

"A City Population which has Lost Contact with the Earth for Several Generations has no Likeness to the Noble Adam, the Father of All Humanity.

"Whatever We, Like King Midas of Old, touched has Turned into Gold, and yet We are Economically Starving, Surrounded by Mountains of Gold."

IF ONE would believe our cellulose chemists, the age of lumber is passing and its place is being taken by wood fiber and cellulose. In spite of all these predictions pulpwood still constitutes only six or seven per cent of our total annual cut. It is possible that in the distant future their predictions may come true, but for generations yet lumber will be the most highly prized product of the forest.

All calculations for future needs for forest products deal with domestic needs. In practically every other field of industrial endeavor production far exceeds our domestic needs. Why should we confine ourselves in timber production only to our domestic needs? We have here on the North American continent the finest plant for growing timber found anywhere in the temperate region, the largest number of useful species of any country in the world. Yet we are satisfied to work this plant only to a fraction of its capacity and are willing to surrender the production of this world-wide needed commodity to such countries as Sweden, Finland, Russia and Canada, the bulk of whose forests lie within the Arctic Circle, and which have at most half a dozen species to work with.

Wood is the most elastic organic matter and can be molded in a thousand different shapes and forms. Human civilization, more and more, depends upon organic matter. The pronouncements of chemists, at times bombastic, that eventually everything will be produced synthetically, overlook the fact that even for synthetic products organic matter is necessary as raw material. They may produce artificial silk, but they need the fiber of wood for that purpose. They may produce generator gas, but they need the carbon of organic matter stored by plants either in past geologic epochs or in modern times.

Organic matter, whether synthetically produced from other raw organic materials or derived directly from the plant itself, is the basis of our civilization. All that the chemists can do is to modify one raw organic material into another organic product of a more finished, usable form. As a matter of fact, the future looks to the chlorophyl engineers, to foresters, and to other growers of plants for the substance of life.

A famous engineer once defined the green plant as the binder of energy, the animal as the binder of space, and man as the binder of time. The greatest moving force in the entire world is energy, and it must come eventually from the green plants and, above all, from the forest as the highest expression of plant life.

Foresters, however, are not concerned merely with the material product of the forest. Forests are an important factor in the climate of the world. They regulate water and save soil. They are the home of wild life and the lungs—the breathing spaces—and playground of mankind.

There is another aspect of forestry which even surpasses all other benefits. This is the future of our countryside.

Not long ago more than fifty per cent of our people were engaged in agriculture and lived in the country. Today only twenty per cent of our population are on the farms. With ample machinery, fifteen per cent of the population are enough today to produce all the food that is required, and ten per cent properly educated farmers could do it. In the last ten years 4,000,000 people have left the land, 19,000,000 acres have gone out of cultivation, and 76,000 farms have ceased to exist as farms. If ninety per cent of our people are going to live in the big cities and only ten per cent on the land, there is a great peril to life and to the quality of our future citizenship. Go to the Lancashire factories of England, or any other big industrial city of Europe or America, observe the shriveled, anæmic, and bloodless people, the third generation of city-bred folks. Humanity is like the ancient legendary giant Antæus, who drew strength from touching the earth. A city population which has lost contact with the earth for several generations has no likeness to the noble Adam, the father of all humanity.

If only ten per cent of the population are to live outside the cities on farms, what is to become of the unlimited vastness of our land? If not agriculture, what else except forests.

There is even a greater significance to the maintenance and upbuilding of our forests, and with them all our primary natural resources, that goes to the heart of our future economic existence. We are reaching an impasse in our national economic situation which at this moment is very acute. Whatever we, like King Midas of old, touched has turned into gold, and yet we are economically starving, surrounded by mountains of gold.

There is overproduction in practically every line of industry, even in agriculture. Our mill capacity is larger than the amount of products that can be consumed. The machine age, by introduction of new machinery and improved technique, is replacing men, both in the factory and on the farm. These displaced men and women can not enter new productive fields. In the last ten years some 500,000 people were replaced by machines alone in the factories, and probably a similar number on the farms. These displaced workers seek employment in the field of personal service, in garages, and in service stations. Some become near-parasites and many enter upon lives of actual crime.

As their purchasing power is decreased the market for the products of the factory and farm is also decreased. And here is the paradox: The greater our technical progress, both on the farm and in the factory, the graver becomes the economic situation.

And what is the answer? A new outlet must be found for the surplus capital, whose reinvestment in overexpanded industry only adds to overproduction and aggravates the situation. At times we hear expressions like, "Oh, if only a new industry would arise on the horizon, an industry similar to the automobile industry of twenty-five years ago." This would release the accumulated capital, place the large number of unemployed in productive occupations, and revitalize the whole economic structure. Capital is now seeking investment in foreign fields. The most absurd doctrines are being propounded, like the doctrine of waste, according to which the products of the factory must be used up, worn

out, and wasted as fast as they are produced, or the doctrine of the production of luxuries, and similar economically unsound panaceas. Yet the outlet for our accumulated surplus capital and human energy is right at home—right at our own doors—if we only had leaders in our economic and industrial field who had the vision to see it and grasp it.

This outlet lies in diverting the surplus capital and surplus human labor into repairing and building up our primary natural resources.

We have gone through this continent as an invading army, pitched our tents, built our main streets just long enough to skim the cream and waste the rest. We have destroyed our forests; we have almost exhausted our mines; we have depleted most of the fertility of our soils and allowed it to be washed away; we have disfigured the beautiful landscape of our country; we have polluted our rivers and turned them from objects of utility into sources of menace to life and property.

We have been on this continent now for over 250 years. This is not a bad country. As a matter of fact, there is no better country in the world. Then why not at last get settled, not for another hundred years but for 1,000 or 2,000 years. Let us begin to build for permanency; let us build for beauty; and let us develop here a culture that will surpass the culture of ancient Greece and Rome.

While the productive power of man has been increased many fold the productive power of nature has been throttled, crushed, and reduced to insignificance. We have built, and are still building, one of the greatest industrial structures in the world, on a foundation that is continuously becoming smaller and weaker. We can not go on like this. Other countries are arising on the historic horizon. They have rich, unimpaired natural resources. If these countries borrow our industrial technique, our economic supremacy may be readily challenged. That country will prove the victor in this economic struggle which has used its primary basic resources most conservatively and intelligently.

If we can divert our surplus capital and labor into these neglected fields—which are the basis of our industrial greatness—new opportunities for productive labor will be opened to millions of people, their purchasing power will be greatly increased, submarginal farm lands will be removed from the market, the rewards for agricultural labor will be greatly increased, the balance between factory and farm will be restored, and the farmers will again become the largest consumers of the products of the factory.

We must revise our old slogans and courageously abandon wornout shibboleths which in their own times may have served a good purpose. In this country we do not need so much a new freedom as a new faith in our own destiny, a new patriotism, and a new love for the country. Unless we get this new faith I am afraid that we are headed toward economic stagnation and social troubles.

Our economic salvation lies, to a large extent, in diverting large sums of money into the reforesting of our cut-over land, in the control of floods, in the improvement of our rivers, in stopping erosion, in restoring the fertility of the land, in developing water power for the benefit of all the people, in the building up of our institutions of learning, research, social welfare, and culture.

As a matter of fact, what do we do in an economic crisis like this but appropriate large sums of money for public works to start the wheels of industry moving? These works, started under economic and often political pressure, are often hastily conceived and poorly planned. What we are trying to do hurriedly at a time of crisis should become the regular, premeditated, definite policy of the Government—Federal, state and local.

You may say, "Yes; this is true; but does it not mean largely public enterprises?" To a great extent, yes; but there are also fields open for private enterprises under public supervision and with public assistance.

Take, for instance, the field of forestry. An analysis of the income-tax returns of our industries—not in a year of depression but in a fairly good year, in 1926, for instance—shows that the total assets of our big industrial corporations amounted to some $250,000,000,000. The net returns on these assets were about $8,000,000,000, or about three per cent.

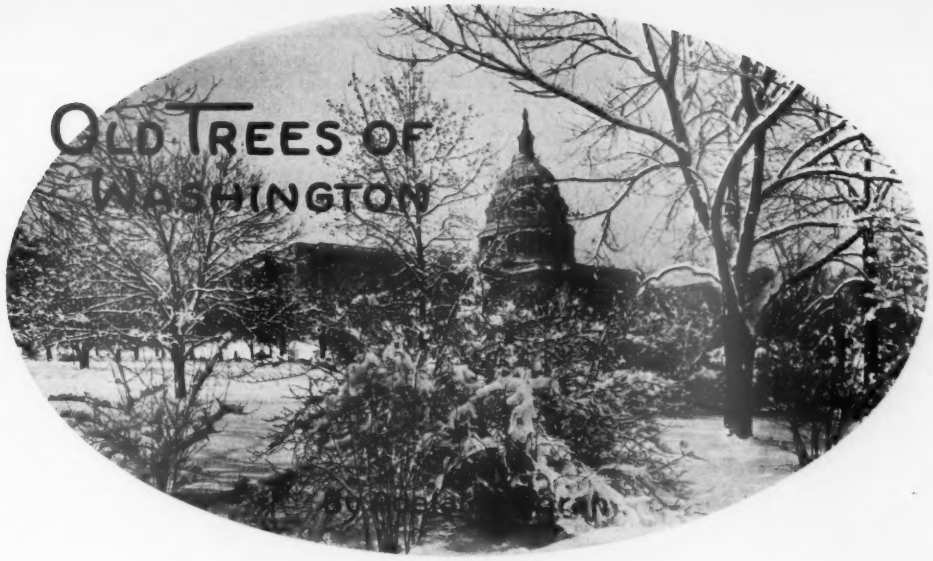
There is no forest in this country, except possibly the swamp forest of the northern Lake States, which is not earning through growth alone, without the effort of man, from two and one-half to three per cent.

It is pathetic to watch how the lumber industry of the Pacific Northwest is trying desperately to liquidate its assets in the Douglas fir forests. The industry has a mill capacity in that region of some 14,500,000,000 feet. It can actually market only 8,000,000,000 feet, and it has a stand of timber in private hands that will last from thirty to forty years. Carrying charges and taxes will bankrupt the industry long before the assets can be liquidated. It can not be done. It can no more be done than if the people of the District of Columbia would attempt all at once to liquidate their houses by trying to sell them. Convert these assets into permanent investments and earn three per cent—and this means forestry—and the whole economic complexion of the lumber industry is changed.

Forestry played an important part in awakening the public conscience to the conservation of natural resources. It has performed a gigantic task. But what it has done so far pales into insignificance compared with what is ahead. Conservation of natural resources is no longer a mere theory, a sentiment. It is today an economic necessity; it is almost a question of economic life or death.

Research in Erosion

An amendment to the Agricultural Appropriation Bill, H. R. 15256, to provide $100,000 additional for research on soil erosion on forest lands as well as open lands, was introduced on the floor of the Senate January 14, by Senator Hiram Johnson, of California. This would make available $380,000 for carrying on investigations in California, the Southwestern States, the Intermountain States, the Mississippi Drainage Area, and in the Appalachian States. The vital importance of the work to be undertaken is attested by the article "Chaining the Father of Waters," by C. G. Bates, in this issue.



Perhaps no city in the world had more famous and historic old trees than Washington. In this article, the second of a series of four, Miss Borah presents the first of these old trees, many of which are still standing. Last month she told of the beginning of tree appreciation and planting plans in the Capital City.—Editor.

IT IS a popular belief that the historical and picturesque Captain John Smith, "Sometymes Gv. in those countryes and Admirall of New England," was the first white man to set foot upon the soil of the District of Columbia, but this belief would seem to be upheld by neither his maps nor his *Historie*, according to some. Had the Captain been able to foresee that a doubt might be cast upon his peregrinations up the "Patawomeck" flu on that morning of June 2, 1608, when he stepped into an open boat with "7 gentlemen and 7 souldiers," a differentiation difficult for us to make, he might not have turned back at Indian Head ten miles below the District line, as he is said to have done. That he failed to run the river further is made reasonably certain, in the opinion of Hugh Taggart, at one time an eminent barrister of the District, by the fact that no mention is made anywhere of Little Falls and its check to further navigation. In his article *Old Georgetown*, of the Columbia Historical Society records, he asserts that the position of the river on the map would seem to have been laid down from tales told to Captain Smith by the Indians. The honor, he believes, of being the first white man to visit this locality goes to Henry Fleete, who had previously been held as a captive here by the Anacostan Indians, and, in 1631, had "returned to the new country on a trading expedition organized in the interests of some English merchants." Fleete's account, he says, of the "ascent of the Potomac and his description of the vicinity of the Indian village, or town as he calls it, of Tohogae, leaves no question in the mind of modern scholars that this place occupied the site where Georgetown was built." Another writer, John G. Shea, in his *Georgetown Old Park*, makes the statement that in Spanish archives there is recorded the visit of a Spanish vessel to the Potomac in the middle of the sixteenth century, and of a mission station established on the Occoquan River around 1570, but that in neither instance was a permanent settlement made. Be all that as it may, there are those who as firmly believe that the bold Captain actually saw with his own eyes what he has set down on his map, and that the description of the place where there was "that abundance of fish, lying so thicke with their heads above the water," corresponds to the narrowest place in the Potomac just below Little Falls. An eyewitness to such a phenomenon related to the present writer that, as late as fifty years ago, in his boyhood, he had seen salmon and sea trout so thick at that point at stated times of the year that a man might almost walk across from one bank to the other upon their backs.

Near Webster Hill, at the Soldiers' Home, stands one of the three old sweet cherry trees now remaining in Washington.

On the subject of trees, no one can say that the "Sometymes Gv." was other than plain, and on his maps he has designated what must have been extraordinary specimens—Walden's Oake, Booler's Bush, Mason's Bushe, and the Democrites Tree. For the last he drew a three-tiered umbrella, each having saw-toothed edges. In his *Historie* he says: "The wood that is most common is Oke and Walnut, many of their

Okes are so tall and straight, that they will bear two foote and a half square of good timber for twenty yards long. . . . There is also some Elme, some blacke Walnut tree, and some Ash. . . . Of walnuts there is 2 or 3 kindes; there is a kind of wood we called Cypres, because both the wood, the fruit, and leafe did most resemble it and of those trees there are some near three fadome about at the foot, very straight, and 50, 60, or 80 foot without a branch. . . . There is a white Popular, and another tree like unto it, that yieldeth a very clear and an odoriferous Gumme like Turpentine, which some called Balsom. There are also Cedars and Saxafras trees. They also yield gummes in a small proportion to themselves. We tryed conclusions to extract it out of the wood, but nature afforded more than our arts."

John Smith took a gamble on the "saxafras," and sent a shipload home on the first return, but there is no evidence that the home folks were more successful in conclusions to extract gum than he had been. It is a strange tree. Edward Wilber Berry, in *Tree Ancestors,* writes that "its whole appearance seems exotic," suggestive rather "of the Spanish Main than staid old New England," that it is in fact, one of the very few of this family of plants of over 1,000 species which has always lived in the temperate zone and remained unchanged in its "mittened leaf" form from the time of its first appearance in the Upper Cretaceous Age. He speaks of the custom of the Choctaw Indians who made a soup flavor from its leaves, and, again, of the "aromatic principle, especially of the roots, which furnished a mild aromatic stimulant, and yielded upon distillation oil of sassafras, sparingly used in perfumery and soapmaking." A writer in early 1800 states that a dye of a "fine yellow" may be extracted from the root, and the flowers serve to make a species of beer. No one seems ever to have experimented with the dark blue berries on their thickened scarlet stems, and yet they carry all the essence of the sassafras tree intensified. A decoction of the bark of the root was wont to be given as a cure for ague. Many today can also recall the pleasantly bitter pink tea their mothers brewed each spring, to clear the blood. Little bundles of the root are still offered by the colored folk in Washington markets.

The largest and undoubtedly the oldest osage orange tree in Washington is at the Soldiers' Home.

The oldest trees in the District of Columbia are without doubt sassafras, a tribute to the saying, "You cannot kill a sassafras." When Baron von Humboldt, the famous German naturalist and explorer, visited the United States on his return trip from New Spain (South America) in 1804, he came to Washington and is credited with having expressed the opinion that the double twin sassafras at the Soldiers' Home were then more than a thousand years old. Each is a double tree, having perhaps been cut back to the roots in a far-off prime. The upper trees are seven feet seven inches and eight feet five inches, respectively, while the lower trees, a few paces away, measure seven feet seven inches, and five feet, respectively. The only other sassafras approaching to their size was measured at Tudor Place in Georgetown, It was five feet six inches in circumference. The trunks of the twin trees at Soldiers' Home, hollow, shrunken, and wizened, appear more like old willows or oaks than the smooth-barked sassafras tree. Yet every year the miracle occurs. Light green leaves, oval or entire, or three-lobed, mass themselves well toward the ends of the branches and bright yellow flowers are born. In the fall the leaves have turned to orange or bright red, and the flowers become dark blue drupes held by thickened red stems.

None other than that great philanthropist, art connoisseur and friend of the District, W. W. Corcoran, is authority for the opinion said to have been held by von Humboldt of the age of the sassafras twins. Mr. Corcoran's country home, "Harewood," adjoined the Soldiers' Home, which until 1851, was the home of the Riggs family, and known as "Corn Rigs," from the old Scotch song, "Corn rigs a-bonny." On the other side of the Soldiers' Home was the Conway Robinson place, called "The Vineyard." It was while driving with a member of the Robinson family that Mr. Corcoran remarked that von Humboldt had thus estimated the age of the old trees. Not long after, another member of the Robinson family was driving by these trees with General Wilcox, then governor of the Soldiers' Home, and he also called attention to them and related the same story of von Humboldt's opinion of their age. Yet the story was not new to the Conway Robinson family. As Miss Agnes Robinson, one of the daughters, in relating these incidents to the writer, stated: "It was mentioned as a fact so often that no one thought to have it recorded." It is a matter of record, however, that the Baron arrived in Washington June 2, 1804, and stayed here until June 13.

Under this cherry tree at Fort Stevens, a small group of government clerks took up arms in defense of Washington during the Civil War. They were buried where they fell.

It was on June 8, during the Baron's sojourn in the city, that the *National Intelligencer* in a long article on the visit of the distinguished naturalist concluded with the following comment: "We are pleased to add that the citizens of Washington, and more especially the President [Jefferson], fully impressed with the great and disinterested services of the Baron, have, by their attentions, paid his talents the respect to which they are so eminently entitled."

The next day, June 9, the President addressed a formal note to the Baron, which reads:

"Thomas Jefferson asks leave to observe to Baron de Humboldt that the question of limits of Louisiana between Spain and the United States is this. They claim to hold to the river Mexicana or Sabine and from the head of that northwardly along the heads of the waters of the Mississippi to the head of the Red River, and so on. We claim to the North River from its mouth to the source either of its eastern or western branch, thence to the head of the Red River, and so on. Can the Baron inform me what population may be between those lines, of white, red, or black people? And whether any and what mines are within them? The information will be thankfully received. He tenders him his respectful salutations."

No doubt the Baron was able adequately to reply to the President's questions, for five years later, he wrote the Baron again, and again in 1811, on April 14, when he enclosed some of his own writings, with the apology, "In sending you a copy of my *Notes on Virginia*, I do but obey the desire you have expressed." The likelihood of the truth of the story of von Humboldt's remark on the age of the sassafras trees is further increased by the fact that the property upon which the trees stand was a part of the glebe of Rock Creek Parish, and has always been in the possession of men prominent in the history of the District, of men who would naturally become the hosts of such a man—John Agg, Leonard Storm, James Hoban, Ogle Tayloe and George W. Riggs, the last named being the owner of the property when it was finally sold for the Soldiers' Home. Moreover, Baron Gerolt, Prussian and then German Minister to the United States, was a life-long friend to von Humboldt, and he had always shown an intense interest in these trees, often driving out there with visiting countrymen to view them.

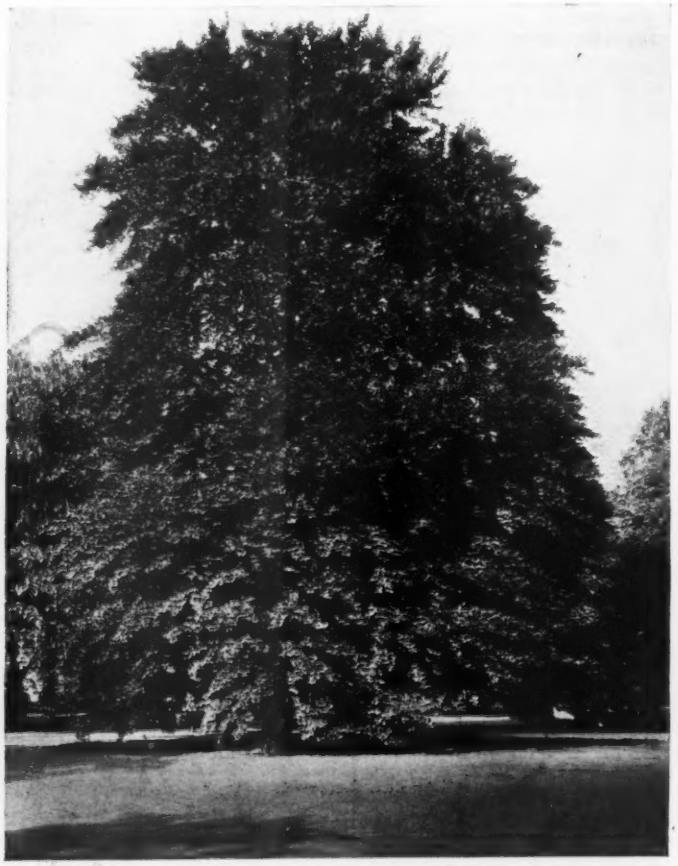
A daughter of George W. Riggs, Alice L. Riggs, was born at "Corn Rigs" in 1840, and, in a letter written in 1901 to a friend she speaks of the trees: "When I was a child, my mother's mother, who lived with us, used to call these trees 'The Twins,' and we had a bench seat between them, which used to be a favorite place for us (as children, my sisters and I) to sit in the shade, have tea parties and play with our dolls. Humboldt was a friend of old Baron Gerolt, . . . whom we knew very intimately. . . . In January, 1851, my father published and presented to some of his friends the translations of an old Spanish manuscript, found, I think, in Mexico, and translated by a friend of ours, relating to the discovery of the Mississippi River, by Cabeca de Vaca, before de Soto. Through Baron Gerolt, I think, this book was sent to Humboldt, and, among my father's letters, he had one from the traveler, thanking him for the work."

On the sloping stretch of greensward near to the sassafras and separated from them by a narrow walk that begins at Scott Hall, fifty paces away, is a native osage orange tree, bright-leaved, with light-green fruit, able to claim a fair amount of years to itself by right of growth. Rising to a height of over seventy feet, the branches spread gracefully from a trunk of twelve feet eight inches in girth. It is perhaps the only example of its size within the District lines, the nearest to it being at the end of the circular drive around the Capitol. A windworn, forsaken relic of an osage orange hedge may be seen on the old road back of Gallaudet College leading to one of the two homes built and occupied by Amos Kendall. Dr. Percival R. Hall, president of the College, allowed one of his students to cut one of them for a bow, the wood of these smaller alien species being preferred above the wood of the yew for bows in archery.

The twin sassafras trees at the Soldiers' Home, the oldest trees within the District of Columbia. Shrouded in history and said to be more than a thousand years old, the trunks are hollow, shrunken and wizened. Yet each year the miracle occurs—light green leaves mass themselves toward the ends of the branches and bright yellow flowers are born.

At the Soldiers' Home is a tiny, pebble-dash cottage, half-hidden by ancient tree boxes. The house was the first to be built on the ground after its purchase by one Mr. Blackford from the church glebe, and continued to shelter all succeeding owners until sold to George W. Riggs in 1849, and even he and his rather large family lived there until a

more commodious establishment was erected. Mr. Blackford had a daughter who married a writer, John Agg, and took up her abode in the adjacent property, "The Vineyard." Their home became the meeting place for distinguished persons, among them being Daniel Webster, the great orator and statesman. His favorite retreat was Mrs. Agg's garden, where he would mount a platform built especially for him in a cherry tree, a tree of noble proportions that topped the highest hill. Three of the steps that led to it were in place when Conway Robinson bought the tract in 1857 from Janet Thruston Taylor, the daughter of its former owner, Judge Buckner Thruston. Here in the tree, on a line with the dome of the Capitol, five miles away, Mr. Webster would sit and enjoy the panorama, the Potomac River, a bright saber in the changing light; the blue hills of Virginia breaking the horizon beyond; and, eastward, the Bladensburg Valley, and all the young city in the foreground. All that is left of the cherry tree now is a vine-covered stump sentineled by old lilacs and two dogwoods on either side in the grounds of the latest owners, the Friars of the Atonement.



The copper beech in Lafayette Park facing the White House.

Sweet cherry trees were wont to be planted more commonly 150 years ago than they are today. Every neighborhood then had at least one or more, and, although they were not native to America, they became as much a part of the life of the settlers in the New World as the town pump, beloved by bird and man. Three survivors have been counted. One on a knoll at the Soldiers' Home not far from Webster Hill is about ten feet in circumference. Two or three of the limbs have been removed, but those that remain measure approximately six feet around. This tree has been dead for several years, however, but the one at the old Emery place on Georgia Avenue, although now receiving surgical aid, lives and has acquired a girth of almost nine feet. Here was the headquarters of Generals Couch and Walker in the Civil War. From the top of the house a signal station was operated between it and the Soldiers' Home where the President stayed during the summer.

A sweet cherry tree, perhaps the finest specimen yet noted, is that one filling the center of the tiny Civil War Cemetery on Georgia Avenue. Under its shadow gleam the white markers of the graves of those government clerks who, upon learning that the Confederates were marching upon the city, rushed from their desks and took their stand under this tree, not more than 200 yards from Fort Stevens, where the President stood under actual fire and watched the battle. These men were buried where they fell and many states are represented on the markers. The tree is apparently in perfect condition. The trunk has a circumference of thirteen feet. One massive limb measures about thirteen feet around, while two others are about five feet each.

The wild black cherry, *prunus serotina,* that "jus' growed wifout no plantin'," is seldom seen of any considerable size in the District. Out along Ridge Road, which, as its name implies, tops the ridge from Reservoir Road to Wisconsin Avenue, in Georgetown, there are a number of wild black cherries. One measures about six feet in circumference, which is also the measure of one at Montrose Park; and at Tudor Place there are two trees that are nearly seven feet and five feet, respectively.

A black haw, *viburnum prunifolium,* can be seen on the high ground at St. Elizabeth's Hospital, in Anacostia, that is three feet three inches in circumference, and is said to be 100 years old. There is a fine collection of haws on the landscaped grounds of the Science Building near the Lincoln Memorial.

On top of the hill, Ridge Road runs by "Lovell Crest," the home of Miss Gertrude Brown, directly across from Battery Parrot, one of the important defenses of the city during the Civil War. The breastworks then thrown up, and the battery, are still as when they were first made, with seventy years gone by. Miss Brown was born at "Lovell Crest," the land for which was purchased by her father, Walter Brown, about fifty years ago and adjoins the C. C. Glover property at the back of it that is to become the Glover-Archbold Parkway. An old-time wooden windmill towers above the trees midway between Miss Brown's home and the stables, the only windmill of its kind in the District.

The Government has negotiated with Miss Brown for eight acres of her land to add to the Parkway, and a portion of this is a beechnut grove on a hill, the trees are certainly over a hundred years old, the largest being about eleven feet in circumference. The little grove of thirteen trees was the burying ground of the family whose name, Jones, appears on the old deed. A white marble slab, with a date of more than a hundred years ago, stood in the center of the circle of trees with the names on it of two of the young children of the family.

Beech groves were numerous in Colonial America, but few of a large growth have survived in the District. Thoreau says, "No tree has so fair a bole and so handsome an instep as the beech." It has a quiet, gray beauty, like very early morning. Upon its smooth skin romance chronicles its thoughts. One tree in Glover-Archbold Parkway bears the likeness of a Gibson Girl with the name above it, "B. Frizzell." Another girl someone loved was "Hattie." A date on still another tree is December 10, 1840, and these drawings and dates are vouched for as genuine antiques by persons who have seen them for many years, yet the trees upon which they are inscribed are hardly five feet in circumference. There is a beech tree of fine proportions on Reservoir Road that is eleven feet in circumference, with several large limbs, one of which measures nearly six feet. Remembering how small a beech tree remains even after a hundred years, it would seem to be a very old tree, unless it is remembered as well that a beech tree on a hill must endure hardships that one situated in lowland never knows. This tree is almost at the intersection of the lower end of Glover-Archbold Parkway and the Georgetown Medical School. An old wagon road went by it to the Lydecker Tunnel, once a part of the old waterworks of the District. When excavations were made at the Medical School not long since, cartloads of dirt were hauled to Reservoir Road at that point for grading. This grading has put the tree literally "in a hole" of about four feet in depth. It is doubtful, had it stood midway of the graded road, whether it would have received the consideration accorded to another tree of history, encountered by Napoleon on his march across the Alps, for he "turned aside his Simplon Road that he might save a tree mentioned by Cæsar."

Copper beeches, being naturalized citizens, like the oriental plane, are a story in themselves, but mention may be pardoned of two copper beeches of such arresting beauty that they have become the favorite trees of individuals who admit that normally trees are trees and they see them in particular only when forcibly halted and their gaze directed upon them. The first is in Lafayette Park, and the other, not so widely noted, is on the grounds of the Capitol, fronting the east entrance of the Senate Wing. If anything, the one at the Capitol is even more beautiful than its brother in Lafayette Park, but that is a matter of preference only.

(*Forbidden, under penalty of death, to go beyond the shade of a great oak tree, a white woman is held prisoner by the Anacostan Chief, Mannacasset. This and the story of other famous old trees of Washington will be told by Miss Borah in the March issue.*)

A LINK WITH THE COAL AGES

By G. G. NEARING

AN interesting little straggler from Carboniferous woodlands is the four-to-eight-inch-high *Lycopodium*, or Club Moss, descended from or at least closely related to the extinct forest giants of that bygone day. Apparently in ancient geological periods one race of trees after another held wide stretches of the earth for a few hundred centuries, then shrank in numbers and size.

The shining ground pine is perhaps the most striking of our half dozen native Club Mosses. Few of us see or notice this shy resident of deep, old woods. Its relatives, the ground pine and running pine, or crow's-foot, are gathered in too great quantity for Christmas decoration, but the structure of the shining ground pine does not lend itself so well to use in wreaths and chains, so it more often escapes the reaping knife.

Surprised in its native leaf bed under the shade of a modern forest, the shining ground pine looks mysterious with antiquity. The deep green leaves glisten brilliantly. Numerous forked and reforked tips stretching upward to their full height of eight or nine inches, somehow suggest the gigantic proportions of its ancestors.

Kneeling and placing your eye level with the leaves you can easily imagine how those prehistoric flowerless forests looked to the creatures that roamed within them. This little fellow, too large for a moss and too small for a shrub, serves as a window through which we can look into the past.

The lovely shining little Club Moss, close relative of extinct forest giants.

Expect this *Lycopodium lucidulum* in dark corners of very old woods. Originally our hills were full of it, but as it will not tolerate sunlight or drying winds, the cutting of the timber is fatal. In this it is unlike the running pine that grows well in open grassy or rocky places.

You can transplant this moss if you have a place rich in woods leaf-mold and protected from sun and wind. It will also survive a long time in the house if placed under glass to preserve a moist atmosphere. A combination with partridge berry is exceptionally attractive.

Thriving plants reproduce themselves not only by spores and by rootstocks creeping under the leaves, but also by means of peculiar buds which drop off and take root in the damp ground. If you find these buds on the downhill side of a clump just as they begin to sprout, transplanting becomes an easy matter.

EDITORIALS

Tree Trails of Washington

GEORGE WASHINGTON, besides being a great soldier and patriot, was one of the earliest of a long line of thinking Americans who saw in trees something more than a commercial enterprise. Characteristically he chose a great elm at Cambridge, Massachusetts, to record the incident of his taking command of the Continental Army. When he handed down to his countrymen beautiful Mount Vernon, no small part of its glory was in its trees, many of which the great American himself planted.

His famous "General's House," which was set up near the site of the present Capitol to afford hospitality to members of Congress, was identified by an elm tree planted at a corner of the building. The Washington Friendship Tree, at Bath, Pennsylvania, the Washington Elm, at Berkeley Springs, West Virginia, and many others are the sort of monuments he wanted to live in his memory. For wherever one follows in the footsteps of Washington there one finds trees that he loved and cherished.

That visitors to the great city and Capital that bears his name should be awed by the trees that are there seems to be but a proper tribute to a man who could find time in the shaping of a new and vast country to express his delight and faith in the living plant. For Washington, the city and Capital, is rich in trees, just as Washington, the soldier and patriot, was rich in his love and appreciation of them. In the January issue of AMERICAN FORESTS there appeared the first of a series of four articles dealing with these great old trees of the Capital City of America—trees so old that the secrets of the birth of a nation might well be held in their grizzled and twisted trunks, trees that were companions not only to Washington, but to Jefferson, Webster, Lincoln, Grant and other mighty sons of America.

What does all of this signify? First, that greatness in mankind cannot be measured without finding a profound reverence and appreciation of trees; and secondly, that nothing is more interesting to all kinds of people than that which intrigues and arouses sympathy.

If this be true, why should Americans not make some concerted effort to locate, mark and preserve its historic old trees, of which there are legion? The American Forestry Association, through its Hall of Fame for Trees, has for more than a dozen years endeavored to stimulate interest in this movement and has succeeded in bringing more than three hundred to light. But it is only a beginning. There are thousands of trees throughout the nation with historical associations that are unknown, even unsuspected—undiscovered monuments to the builders of the country. Daniel Boone and Kit Carson, among many others, like Washington, were outdoorsmen and knew trees, undoubtedly loved and cherished them, and in their wake, over the trails they traveled, there are trees, many trees, that grazed their lives. Should not these be found, protected, and their story recited to the world?

In Virginia, the boy Washington established many line and witness trees while surveying certain lands in the wilderness lying west of the Blue Ridge Mountains and extending to the headwaters of the Potomac River, part of the vast holdings of Lord Fairfax. One of these trees is known; in fact it was planted by young Washington at Berkeley Springs, West Virginia, to mark the southern boundary of the grant of Lord Fairfax. But undoubtedly there are others, lost in that once great wilderness, which, in semblance, is still a wilderness. Locating and marking these historic old trees is an adventure that challenges every boy in the country, that stirs even red-blooded adults. Once the number of these original trees is known and they are located, as far as possible, every boy and girl in America would be benefited and tree and forest appreciation will be furthered to a mighty degree.

For tree sentiment born through historic association, if that sentiment be shaped constructively, is apt to develop into forest sentiment and an acceptance of the basic truths of forestry and conservation. This is especially true in children, for whom history and its associations have a vital fascination. If the child mind can place its own value on individual trees, even though that value be purely historical, there is little to fear in its future acceptance of tree values. Washington's love for trees, like that of many others, can be handed down through the trees he loved.

Young Timber

ON THE 8th of February of this year the Boy Scouts of America will celebrate their twenty-first birthday. As an organization they will come of age, but the constant flow of new recruits gives them the vitality of perennial youth. Founded on the principle of service and clean living, scouting has proved itself one of the most powerful influences of the age in bringing the youth of the country in contact with the woods and the outdoors. Interwoven through its many activities are numberless opportunities to give expression to the inherent love for adventure which every boy has tucked away somewhere in his being. In forestry, scouts have not only found adventure in contact

with the warm earth and the living things that spring from it, but they have seized and carried forward with impressive strides the opportunity to render a great service to the trees and to their country.

The American Forestry Association extends its greeting to Boy Scouts everywhere on their twenty-first birthday and congratulates them most specially on their splendid work in forestry. It deems it an honor to be closely associated with them in their forestry activities. Many of its members throughout the country are leaders in scouting, and The Association as a whole is cooperating with scouts locally and nationally. Thousands of scouts over the country are carrying a little celluloid card furnished them by The Association and bearing the inspiring words of John Ruskin, "God has lent us the earth for our life. It is a great entail. It belongs as much to those who are to come after us as to us and we have no right by anything we do or neglect, to involve them in any unnecessary penalties, or to deprive them of the benefit which was in our power to bequeath." Not alone in forestry, but in other fields as well, Boy Scouts are putting these words into action.

During the past year the scouts and The American Forestry Association have joined in an effort to restore the native nut trees of our country. By this project, Boy Scouts will collect nuts from trees growing on historic ground and send them to Washington where at the proper planting time they will be distributed to other scouts for planting. Already scouts from the District of Columbia, Georgia, Pennsylvania, Illinois, and Virginia have sent in walnuts gathered from trees growing at Mount Vernon, Monticello, the grave of Nancy Hanks, the battlefields of Gettysburg and Honey Hill. Bushels of nuts are now safely stored underground at the Arlington Experimental Farm of the United States Department of Agriculture. Next spring they will be distributed to the scouts for planting in school grounds, scout forests, or along highways in states where soil and climatic conditions are adapted to the growth of our native walnut trees.

The project is the outgrowth of work started years ago by Dan Beard when he led a group of scouts to the walnut trees that shade the grave of Theodore Roosevelt. Here they gathered nuts and sent them to scouts in other parts of the country who planted them and cared for them. Trees have sprung from these nuts that are now beginning to bear new crops of walnuts. The present project, made possible by generous contributions from men and women interested in boys as well as trees, will link Dan Beard's idea to other national shrines and to scouting as a whole.

The nation may well be proud of the many forestry activities of the Boy Scouts. Every state in the Union has been enriched in one form or another by their forestry work. They have planted thousands of acres to trees. They have started nurseries. They have fought forest fires. They have collected tree seeds. They have established scout forests. They have helped beautify communities and roadsides. And by their diversified forest activities, they have awakened grown-ups to the need of forest culture and forest protection. Thousands of them wear merit badges for work well performed in forestry. But whether or not a scout has won his merit badge, the broad outdoor activities of scouting are leavening the youth of our country with a woods-mindedness and that is a contribution to forest protection and forest progress that projects its benefits far into the future with ever-growing results. The boy that learns to be careful with fire in the woods, to know the meaning of forests in values of beauty and industry, wild life and recreation, soil protection and stream control carries that knowledge into manhood and as doctor, lawyer, farmer, or business man, he becomes an understanding, enlightened friend of the trees.

Boys are the young timber of our manhood, and scouting helps them to grow straight and clean. Every year their numbers increase, and by the same token every year the army of woods-minded, tree-loving boys and men grows larger. Thus scouting, in addition to all its other fine attributes of good citizenship, is helping in a large way to build a nation of boys and men who know and feel the influence of the woods upon community, state, and national life and who are better prepared to meet that great social problem that looms larger every year—how to keep our country lands economically productive and habitable.

Crashing the Solitude

"THE day is coming," said President Hoover, as quoted in a recent number of *Woman's Home Companion*, "when there is going to be a premium on solitude. If a man can find a piece of land anywhere in this country where he can't hear a bell ring or a whistle blow, that's the place he'll want for a home."

This sentiment is shared by many people who see in the movement to preserve some of our remaining wilderness areas a way of meeting an essential hunger of a vigorous race. One of the finest wilderness tracts left on the American continent is the region that borders the international waters in northern Minnesota and southern Ontario known as the "Superior-Quetico wilderness." Conservationists who fought the long, hard battle to assure its preservation will not soon forget the victorious passage of the Shipstead-Nolan bill on July 3, 1930. The wilderness assets of this region, becoming more and more rare under our high speed, destructive civilization afford peace, quiet, and inspiration of solitude, with rugged adventure. Unless these wilderness characters are maintained the Shipstead-Nolan Act will prove futile.

Within the region designated by the act are thousands of acres of privately owned land. These tracts are interspersed throughout and adjoining the Superior National Forest. Private land holders in the area are anxious to utilize the present public agitation in favor of road building as an aid to unemployment. Roads are being sought to isolated private holdings, where there is no present population and no public need for roads. If these go through the present public opportunity in that region will be largely destroyed.

To forestall crashing the solitude of the Superior wilderness with roads to carry automobile loads of tourists into areas which should be kept sacred to hikers and canoeists, the government must acquire title to the private lands in the designated wilderness area as rapidly as possible. This can be done by direct purchase under the Forest Purchase Act by which the Forest Service is authorized to buy private lands for National Forest purposes; it may be accomplished under the authority granted the Forest Service to exchange forest lands or stumpage elsewhere for private land; or funds may be raised by public subscription and the lands deeded to the government. Of these three methods, direct purchase by the government as a part of its forest acquisition program is most logical. The private lands involved could be purchased with reasonable dispatch if Congress would increase the present appropriation for purchasing forest land. The American Forestry Association has long urged the importance of expanding this work in the eastern United States, and the Superior situation drives home with alarming force the importance of aroused public support.

THROUGH THE LENS

Short Lessons in Photography for the Outdoorsman

CONDUCTED BY FRED H. KISER

THE making of pictures is a joyous occupation. That is, of course, if one loves the work. As an added pleasure it throws one in contact, personally and through correspondence, with thousands of people in all walks of life. This, at least, has been my experience in thirty-three years of photography.

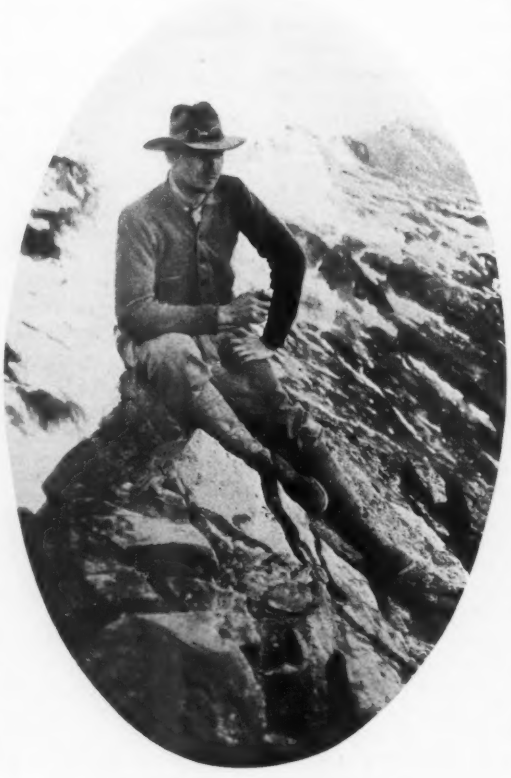
Unusual travel experience, occasioned by various picture commissions, are numerous, and one meets all classes of outdoorsmen—Indian, trapper, miner, homesteader, hiker, mountain climber, dude trail rider and the automobile pathfinder—all different in character but imbued with the spirit of the wild; and all, with the possible exception of the Indian, interested in pictures.

With the distribution of pictures comes messages from one's countrymen and friends of far-away lands who, at one time or another, have had a thrilling outdoor experience and desire a "constant reminder." This is an unseen clientele, the contact of which is established through the ordinary channels of business, but which usually grows to more or less friendly relationship.

At the studio, in a dignified atmosphere, one meets the élite, each of the group distinctive and in excellent taste, but each one expressing different fixed standards in relation to art. This class belongs to the same family—that of the great outdoors—else they would show little or no interest in outdoor picture-making endeavors.

In this I am trying to convey that from my point of view, artistic emotions and travel inclinations are closely related. One is not experienced without the other, although the dominant urge may be just the desire to go somewhere.

The words "art" and "artistic" in this age, embrace so many rules, the principles of which are embodied in natural individual ability, skill and power, and for the attainment of some end, that it seems useless to attempt a definition for them. In the highest sense the word "art" has no synonym. So, as we reach higher planes and attain greater accomplishments, indulgence in its use follows and almost becomes a necessity. Unfortunately, along with this condition follow those who belong to the vast army of inefficiency, who continually seek to commercialize what little ingenuity they have at the expense of the public, yet classify themselves under the same heading "art." In using this word, I wish to adapt it only to pictures, as a branch of learning to be studied and applied to all of the outdoor beauty around us and of which we are a part.



Fred Kiser A'Top the World!
On the summit of Mt. Sahale—one of the highest peaks of the Cascades.

These statements are not made in an attempt to clothe myself in the garb of a critic. Never have I served on a "jury of awards" or taken any part in handing out "gold medals" for the "best" creation in pictures, or the product of any other so-called "branch of art." I shall endeavor to relate my own conclusions as a professional photographer. So, in making use of what I consider a great privilege in contributing to this magazine each month, I do so with the unbiased feelings and opinions of the layman. Mine is an unyielding determination to improve the standard of my special and fascinating occupation, and to impart to others, insofar as I am capable, the knowledge and sentiment gained while attempting to satisfy such a desire. The January issue of AMERICAN FORESTS relieved me of the duty of an autobiography. Who I am and what I have done has been presented in a very generous manner. I consider myself most fortunate in being a member of The American Forestry Association, and I feel sure there is going to be a great satisfaction in doing my bit as a co-worker. As a reader your suggestions and criticism, friendly or otherwise, will help this feature to become really educational and useful. My greatest desire is to stimulate interest in the making of better pictures that tell a real and beautiful story of a real and beautiful outdoors. I am convinced that this particular type of picture is important to the lives of most of us. There is something spiritual, something inspirational in the right kind of picture of floral meadows, singing streams, emerald lakes, mighty forests, waterfalls, and snow-capped peaks. The intriguing charm of the desert and the sunset pathway of a restless sea may be held in a good picture.

Briefly, the main object of these discussions is to stimulate interest on the part of old and young in using a camera and to assist in the attainment of good pictures. It is hoped to encourage the making of more and better outdoor pictures, whether for interior decorating or for pictorial education in its various branches.

I am convinced that in this age of terrific speed people are becoming more and more indifferent toward outdoor beauty. In order to make time and register mileage they become careless in their observations. Therefore, I expect to display "caution signals," from time to time, in the hope

that time will be taken to absorb at least some of the beauty along the highways and trails. I hope to help in the appreciation of pleasing compositions, the perfect blending of innumerable colors and the harmonious arrangement of all things. When one can fix his silent attention on the most glorious effect of the day, a sunset—just before the curtain goes down—there is a revelation that enriches his life forever. If such a glorious spectacle does not take absolute possession of one, there is something wrong.

feature of AMERICAN FORESTS has a wonderful opportunity in urging and assisting them to put this artistic sense to work.

There is nothing I can say or do, however, to which could be attributed the production of pictures that bespeak the God-gifted talent of an artist. All I can hope to give each month is an idea here and there which will be helpful in picture work. And while this feature will be fundamentally educational, primarily for the amateur photographers and

Photographed by Fred Kiser

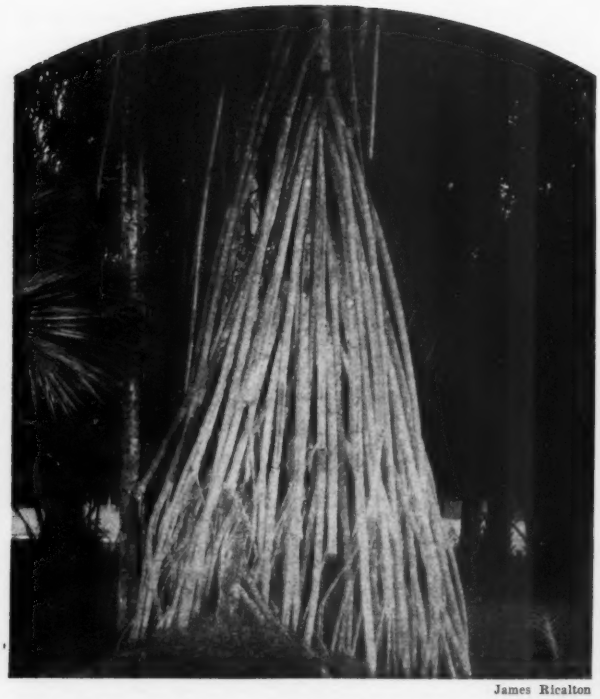
The changing beauty of sunrise on Mt. Shasta—caught and held permanently by the lens.

So I shall work on the theory of "less momentum and greater observation," expecting the individual reaction to finally culminate in a desire to register or procure some picture form of that which is visualized. From then on pictures become associated with thoughts and expressions.

Travel is steadily increasing each year, influenced largely through an inherent desire to explore and see new things. And, one thing is certain, every traveler is endowed with a certain amount of artistic sense, else there would be no desire for a change of environment. Surely this new picture

others artistically inclined, I shall have much to say about professional art and its various branches as I understand it. I propose to propound and expound theories dealing with numerous kinds of pictures and their production and commercial distribution. Then there will be a real camera hunt—in the mountains, on the desert. Later on, there may be a question and answer column and several picture contests, with prizes, of course, to make it worth your while. I believe all these endeavors will tie into your general program for the making and appreciation of better pictures.

On and Off



James Ricalton

In Ceylon nature resorts to tricks in protecting her own. Here the screw pine tree, or "Pandanus," spreads a unique root system above ground.

Western yellow pines of different ages and sizes, on the Flathead Indian Reservation, in Montana, have grown together and have but one crown.

Charles D. Faunce

Gerald Lum

Michael Harrison, Chief Clerk of Grand Canyon National Park, shares his cigarette with a yearling buck. It was consumed, paper and all.

The Washington State Historical Society has an unusual picture story of nature—letters of the alphabet, natural crooks and twists from the forest.

W. P. Bonney

THE TRAIL

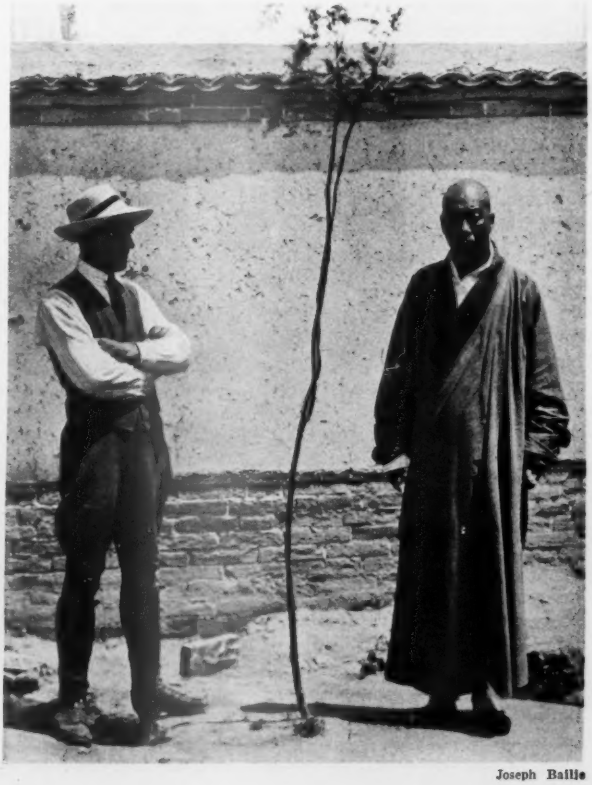
Clark Blickensderfer

"Who's there, please?" This wise old owl looks down upon an unexpected visitor from a window in the second story of its home in the forests of Oregon.

Paul W. Kearney

An elm tree and a fence join forces at Deerfield, Massachusetts. Built years ago, the fence is now held fast by the growing roots.

In China a twisted tree is admired by the natives, and this young sophora has been given early "treatment" by having its branches plaited.



Joseph Baillie

This famous weeping beech at Flushing, New York, is said to be the sire of all the trees of its species in the eastern part of the United States.

Paul W. Kearney

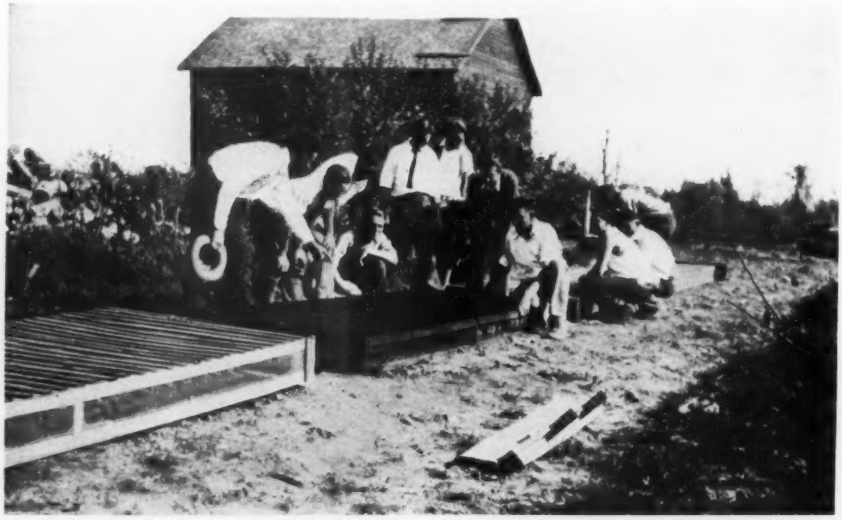
A Forest Page for Boys and Girls

Conducted by
William McNeel

ANOTHER holiday season has passed, and again evergreen trees have done their part in the rôle of joy-givers. They have blossomed with lights and tinsel and toys. They have carried the spirit of the season to homes and communities. What would Christmas be without evergreen trees? Of course it brings a pang of regret to tree-lovers to think about what happens after the trees have fulfilled their joyous mission. In this respect a Christmas tree is like the salmon that spawns, then dies; gives its life that there may be more abundant life.

HAVE YOUTH AND TREES GROW UP TOGETHER

It is interesting to learn how one boy avoided these pangs of regret. A number of years ago he collected seeds of the white spruce, made his own seed bed, transplanted the seedlings when several years old, and now he has a great many fine spruce, about eighteen inches high. Each year he pots many fine specimens for Christmas presents. And what messengers of the Yuletide spirit they are! After these trees gladden the homes, they are planted in the yards and woodlots, to be a continuing joy.



The boys inspecting the tree seed beds—preparing for a future Christmas tree crop.

The lad shows his ingenuity further in the kind of pots he makes. He finds a fallen birch, cuts off cross-sections of the trunk, removes the heart and sapwood, makes a bottom out of board, and paints the interior with asphaltum paint. This becomes the temporary quarters for the tree. His trees have developed compact root systems by transplanting, and by careful potting and thoughtful care are made to live on.

We witness so often and have our attention called so frequently to letters and reports describing things boys are doing in the interest of conservation. Their splendid example of purpose and courage is exerting a great influence in causing others to become interested and active in right practices. A group of boys in a community in Florida organized a fire-protection club which was responsible for putting out many fires before any damage was done. Some boys in a northern state patrolled a road that skirted a large tract of tax-delinquent land. They did this to prevent the stealing for the Christmas trade of thousands of fine specimens of spruce and fir. Another group undertook to arrive at some estimate of the number of acres it took this year to supply the demand for Christmas trees in their state. At the time of writing, they found it took over three acres to supply the trees brought to their small city. They arrived at this estimate by visiting every vendor of Christmas trees in town to get the total receipts of trees. To this they added five per cent for gifts of trees sent in and those collected by individuals from the countryside. They divided this total by two hundred which was their guess of the number of trees growing on the average acre.

They plan to find out the number of trees unsold, and so come to some conclusion about how far the supply exceeds the demand, and the number of trees that were cut needlessly. Through this study of the unregulated cutting and sale of trees they are acquiring their own convictions about what should be done. Soon these boys will be voters and lawmakers. When that time comes, we hope they will have still the courage of their convictions.

Many young folks have found joy in feeding winter birds. Most do this feeding at home and the birds come to them. I know of a club that goes to the birds and builds feeding stations in birds' habitats. At regular intervals someone visits the stations and replenishes the supply. The great advantage of this scheme is found in the necessity for the

boys to get out into the field. That means a great deal. The stations are located in a tamarack swamp, and the club has the name of the Maschkigi Wateg Rangers. It is an appropriate name for such a club, for it means the tamarack.

Each year on the day after Christmas this club of boys takes a census of the winter birds. This census-taking is a tradition with the club. In taking the census the members spread out and travel abreast, covering a number of square miles in all kinds of country, taking notes which are compiled later around the camp fire. It is a great day for the club. This year I am going to help take the census, and readers who are bird-lovers can look forward to some interesting details.

ENDEAVOR DEVELOPS APPRECIATION AND ENJOYMENT

The young spruce in its temporary home—an attractive birch pot.

One of the deep joys of the great out-of-doors is the hearty appetite that comes from the labor of preparing the meal and cooking it over glowing coals. We have a tradition that when I go hiking with a group of boys the fire will be started à la Indian; that is, by flint and steel, or by friction of wood upon wood. Rain or shine this tradition prevails. As a consequence many boys can start a fire readily without the match.

The flint and steel method dates back to the pioneer days of our country. Recently I visited a historical museum and spent some time looking over the equipment used by colonists in overcoming the difficulties of their times. By the fireplace was the tinder box and a bit of steel and flint. The tinder box was receptacle for perfectly dry punk which was pulverized until very light. In getting a fire a few grains of black powder was sprinkled over the punk. These grains of powder would catch the spark quickly and ignite the punk.

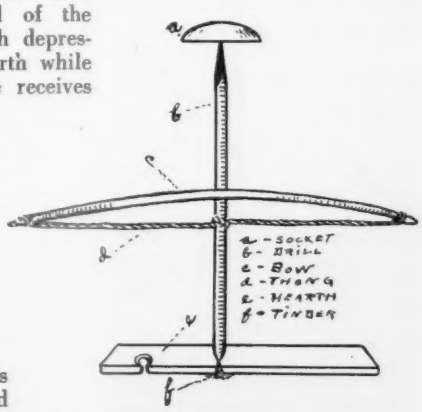
Now most boys use charred linen for tinder. An old file or piece of broken saw is used to strike the flint. The sparks are made to fall on the charred linen. One of the many sparks is sure to set the linen a-glow, and this can be fanned to a flame. Then very light tinder, thin shavings and the like are added. It is a victory worth expanding your chest about to build a fire as our forefathers had to do it. The same principle is involved in the modern pocket cigarette lighter. In this the gas is the tinder. The cigarette lighter is prohibited on our trips, however. When we see the crude furnishings that our forefathers used we can understand clearly why so many great men of history came from so primitive an environment. They had rugged hills to climb and developed wind, muscle and stamina in the climbing.

To make a fire by friction requires a little more equipment, and considerably more "elbow grease." A set consists of a bow and leather thong; drill socket, sometimes called a thunderbird; a drill, a hearth, and tinder. The bow is made from a rather sturdy branch about two feet long that has at least a two-inch curve. The bark is removed except at the heavy end. This is the handle. A hole is drilled about one-half inch from either end of the bow. Thread the thong through these holes, twisting it before it is made fast, and allowing a slight slack, since the thong must be wrapped around the drill.

The drill socket is made out of an oval piece of hardwood about two and one-half inches long by two inches wide with edges trimmed to fit the hand. On the under side, in the middle, a smooth hole is made. This hole receives one end of the drill. Soap is put in this hole to reduce friction. A hole is sometimes made deep enough to take a thimble or a smooth stone and more satisfactory results are secured.

Most fire-makers make the drill and hearth out of the same kind of wood. White elm, red cedar, basswood, white pine or cottonwood may be used. The hearth is two inches wide, eight inches long and about three-quarters inch thick. Notches are cut along the sides at intervals of one and one-half inches. Each notch is one-half inch deep, wider on the under side; and on top at the inner end of the notch a pit or hollow is made. This hollow receives the drill, as the illustration shows. The drill is made octagonal in shape by first making it square, then whittling or shaving off the four edges. It should be about two-thirds of an inch thick. Be very careful in selecting tinder that is absolutely dry and well prepared. Success in getting fire depends upon the tinder. The Indians used the inner bark of cedar which they shredded by pounding and rolling. The inner bark of the cottonwood is good. So are mice nests, some birds' nests, shredded hemp or grass.

Now everything is ready to make a fire. Place a quantity of tinder under the notch and rest the hearth on the ground or on a board. Kneel on the right knee, place ball of left foot on one end of the hearth. Take a turn of the thong around the drill. Place one end of the drill in a notch depression in the hearth while the socket hole receives the other end of the drill. The socket is held in the left hand which is kept steady by pressure against the left knee. With the right hand the bow is brought back and forth with steady strokes while pressure of the left hand is constantly increased, as is the speed of the strokes. A dust is ground out that falls through the notch onto the tinder. This soon smoulders because of sparks formed. When this point is reached, carefully pick up both tinder and hearth and blow gently or fan the tinder until the sparks burst into a flame. Now add shaving and fuel already prepared. Again you have mastered a secret of nature by your strength and ingenuity.



To make a fire by friction is a real achievement, and the necessary equipment can be handily made by any boy, as shown in this sketch.

What is your favorite tree? Write a letter naming it and tell us why. If the letter is fine enough to be quoted from you will receive a forestry scrapbook with beautiful cover and heavy blank pages, ready to receive clippings about trees and the outdoors.

CHAINING THE FATHER OF WATERS

(*Continued from page* 70)

would be approximately 2,000 c.f.s., a matter of two per cent of the volume. But the fact of the matter is that during the period of rising flood the stream would for some time pick up all that it could possibly carry, which, it is believed, might readily exceed the above figure.

From the standpoint of flood control the solid load carried by the river and left as deposits in the lower channel means insecurity for dams and levees. The load carried in flood times causes increased volume of flow, but particularly much greater difficulty in handling water by diversion or any other means, since a stream, which may momentarily drop even two or three per cent of its volume through slackening current, will quickly fill any channel and be subject to sudden shifting.

From the standpoint of channel improvement the load carried by the upper Mississippi within the sector described has heretofore meant constant dredging at many points, and necessity for building hundreds of jetties or wing-dams to narrow the channel artificially, speed up the current, and kept it "scouring." The deposits which are made within two or three years, in the quiet water between these wing-dams, is eloquent proof that the river is overloaded with silt. Under the plan which is now proposed for making a still deeper channel, it is obvious that an even smaller proportion of the silt brought into the Mississippi can be currently carried downstream, and that the so-called "pools" will retain the residue. Even the advent of high and relatively swift-running water cannot be expected to scour these deposits much below the tops of the dams, since the slope of the river-bottom is an important factor in keeping the bed load in motion. In short, it can be no more than a matter of a few years until the pools are practically filled, and the only resort will be to build the dams higher and higher. Such a plan of development will mean a constant uphill fight, and a maintenance expense which will represent an unreasonable charge upon all of the barge freight that can ever be carried on the river.

So far the discussion has been confined to the volume of silt being eroded from the farmlands and its bearing upon stream conditions. The occurrence of so much erosion points unmistakably to excessive surface runoff at the expense of deeper seepage and steady spring-flow. The two things are inseparable and mutually contributory.

This surface runoff which, under other conditions of cover, would largely or wholly become percolation, means two things: Shortage of water in the soil and in the streams when current precipitation is short or lacking. The effect of the first on crop growth is obvious. Quite apart from soil saving, it seems probable that terracing will pay for itself by increasing the moisture in the soil. The writer has never seen a region, blessed with horizontal strata of sandstone and limestone which should be water-bearing, in which there was a greater paucity of springs than the region immediately adjacent to the Mississippi. Watersheds of a few hundred acres in the steep bluff country are almost universally without living streams.

Assuming that the 10,000 square miles of nonglaciated territory supplies normally to the Mississippi about 8,000 second-feet, or nearly half of its discharge in this latitude, it is obvious that the complete elimination of dry-weather flow from a considerable part of this area cannot fail to have an important effect upon the navigability of the river, most strikingly in such seasons as that just past, when the low stages of 1864 were exceeded at most of the upper Mississippi gauging stations.

It cannot be denied that there is an agricultural territory of many times 10,000 square miles supplying tributaries of the Mississippi below the southern boundary of Minnesota or Wisconsin, in which farming has increased sudden runoff and depleted the steady river feeders, in the same direction if not quite to the same extent as in the nonglaciated region. The facts and implications of excessive and unnatural runoff and of silt in streams, in whatever degree they may be encountered, cannot be gainsaid.

Hence the emphatic contention that the proper, the economical, and the only permanent control of the Mississippi River, or solution of its flood and navigation problems, is to be worked out upon the land. The difficulty of it lies not in the technical problems it presents but in the personal equations, the individual ownership of land, the well-known and respected independence, and even obstinacy, of the average farmer.

It is a far simpler matter to control the behavior of a small stream than of a large one. When silt has reached a large stream there is mighty little that can be done about it. It cannot be much hurried on its way, and wherever it remains it is in the way of something. The obvious answer is that "silt" should, insofar as is possible, remain with the soil upon the land. On the land, soil is soil but in a stream it is mud or filth or any other undesirable thing you may wish to call it. And its presence in the stream invariably implies an excess of runoff water which should also not be there.

The things which must be done are to reduce the very general runoff and erosion from fields to their absolute minimum consistent with cultural operations and the permanent good of the farming resources and to stop all important gullies. The former depends on better cultural practices, on terracing of the land, the cessation of cultivation of some of the steepest lands, greater dependence on permanent hay and grass crops and greater intensity of farming all around. Terracing in some cases involves minor engineering problems which need not be discussed here. All of these practices lead to appreciably greater absorption of water into the soil. When one has considered soil reclamation works from the standpoint of both the farm and the stream, he will inevitably come to the conclusion that the two main objectives must be to cause as much as possible of the precipitation to be directly absorbed into the soil of fields and forests, and to create artificially as many small ponding areas as possible at points where they will have the most constructive effect. The flooding, for storage purposes, of good river bottoms which are already well watered and fertile is to be resorted to only when it is not feasible to control all of the tributaries. The gradual seepage of the water from many ponds on relatively high ground would in a degree reestablish the natural balance between immediate and more leisurely runoff in the larger streams.

Hence the plan of gully control, in which dams are employed to make ponding-spaces of the gullies themselves, causing them to hold back storm water, and eventually to become filled by the coarser silt which would otherwise pass on into the larger streams. The idea of ponding runoff waters is the essence of erosion control, is the means of eliminating destructive gullies and is the most practicable method by which the material washed from fields can be kept from polluting streams and causing the difficulties which have been enumerated above. While space does not permit entering into any of the technical phases of such a project, it may be stated that the engineering problems of such control works are very simple, and that their practicability has been substantially proven in the agricultural extension work in Wisconsin and elsewhere. As to the cost of such work, while it may (*Continuing on page* 127)

All in a Day's Work

By J. P. Locke

TO USE an aviation term, I won my wings shortly after I completed my forest engineering course in college. I was sent out on my first timber cruise. It was early March and from four to five feet of snow still gripped the northern forests of New Hampshire. The timber I was to cruise lay in a valley of about eight thousand acres, and since it was a short distance from our main camp I decided to tackle the job alone. I was confident that I could make the cruise in a week, confident I could do it well, and confident I could do it alone. Had I not won my wings as a forester?

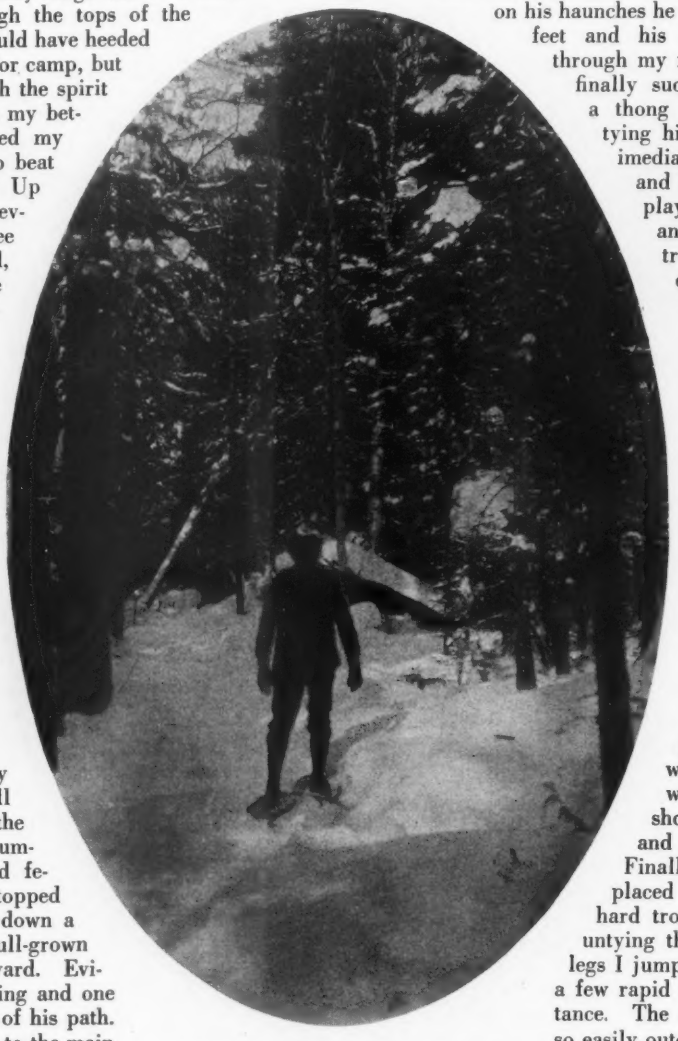
Too, I had in my favor the fact that I was born in the most northerly town in New Hampshire and had roamed the forests with my father from the time I was able to pack a blanket. I had been taught wood lore and knew the fundamentals of self-preservation in the forests, especially a snow-bound forest.

With a light pack I put out at daybreak on my snowshoes and made fairly good time despite the fact that the deep snow made snowshoeing difficult. I had made arrangements with a trapper to use his cabin as a headquarters camp, and reached the location about mid-afternoon. I was proud of the fact that I found it without difficulty; but a bit startled and dismayed to find that the great weight of snow had crushed the little camp like an egg shell.

Using a snowshoe as a shovel I soon cleared through six feet of fairly light snow, and as luck would have it, one end of my excavation exposed the woodpile my trapper friend had left. I cut a plentiful supply of fir boughs to serve as a bed, and on this put several armfuls of white birch bark for dryness. By the time I had made coffee, fried bacon and eggs, and had a little drag on the old briar, the stars were coming out one by one. Cutting more boughs I covered my house in order to keep in as much heat as possible. Then I crawled into my birch-bark bed. I awoke next morning just as the stars were paling in the eastern sky. After a good breakfast I put out with my sketchbook and compass to explore the east branch of a stream. I had traveled a short half mile from camp when suddenly coming out on the edge of an old beaver meadow I saw two large animals which I took to be deer. Further investigation revealed two cow moose with a smaller one a short distance behind that had evidently come out of the neighboring swamp to get the morning sun. However, as I had my day's work ahead of me I left them undisturbed and proceeded upstream, stopping now and then to take a count, or explore some small tributary. For the next hour or two I climbed diagonally up the side of a steep mountain and about noon sat down to eat my lunch on the international boundary, with one foot in Canada and the other in the United States—monarch of all I surveyed. The day had been perfect, and wishing to take advantage of all the good weather possible, I gave the last remnants of my lunch to a pair of hungry moose birds perched on a near-by limb. Laying my course for the headwaters of the west branch I was soon traversing the

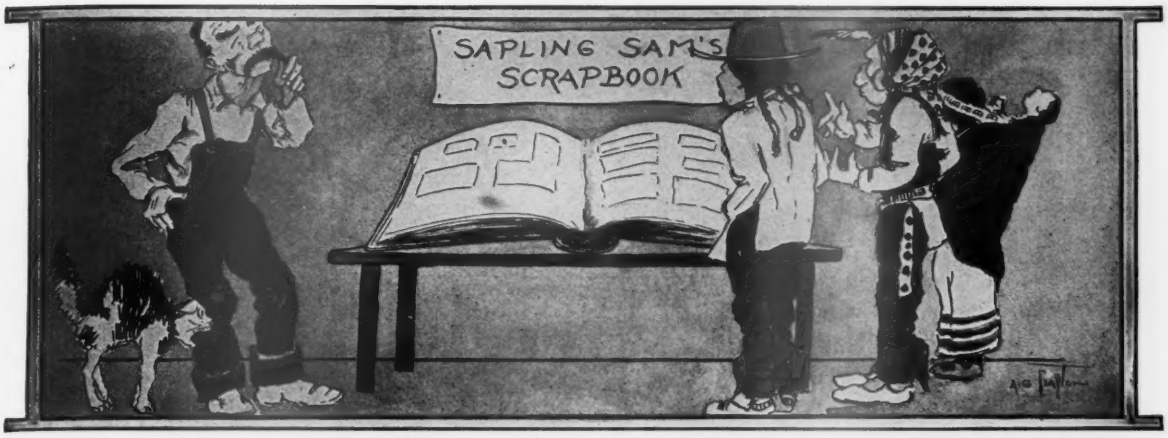
The sky had gradually become overcast, and I decided to head for camp and try to beat the rapidly oncoming storm.

heavy spruce and fir growth typical of our northern mountains. About two o'clock in the afternoon I dropped down the western slope of the west branch and started the long half circle of the northern end of the valley. The sky had gradually become overcast and already large flakes of snow were sifting down through the tops of the spruces. Ordinarily I would have heeded this warning and headed for camp, but being suddenly seized with the spirit of adventure, and against my better judgment, I quickened my pace in a vain attempt to beat out the oncoming storm. Up to this point, I had seen several deer yards with three or more deer in each yard, but as I swung around the south slope of the mountain it seemed as though the deer were all in one vast yard. They were continually scattering from in front of me as I walked. For those who are not familiar with the habits of deer in winter, a word of explanation may not be amiss. When the snow gets so deep that the deer cannot readily walk around in order to feed, they usually select a thicket near the bank of a stream, or in swampy ground. They make numerous paths in which they feed, and these are kept well beaten down throughout the winter. Under no circumstances do the males and females yard together. As I topped the next rise and started down a long, gentle slope three full-grown bucks appeared in their yard. Evidently they had been feeding and one was out nearly to the end of his path. As I had cut off his retreat to the main yard his only alternative was to take to the deep snow, and after about three jumps he was stuck fast. His predicament aroused my sympathy and I determined to lend a helping hand. He might die of starvation if left there. At first he seemed quite willing to accept my proffered aid, but as I struggled with him he suddenly uttered a cry of rage and gave a bound, landing squarely on my snowshoes. With this added weight I immediately bogged in the soft snow, and was thrown off my balance. The buck had me at his mercy.



I plodded along through the misty darkness, my compass lost—but good fortune guided me to what appeared to be a small abandoned log camp.

I was face down in the snow, my feet fast in my snowshoes with the deer doing a hornpipe on top of me. I would have been justified in reaching for my revolver and ending the struggle, but as I had no dislike for a good scrap, I determined to give the big fellow a square deal. I had on a red lumberman's jacket, and this did not tend in any way to soothe his feelings. He would consider the jacket a moment and renew his attack with increased vigor. Settling back on his haunches he would strike with his forefeet and his sharp hoofs would cut through my red jacket like a knife. I finally succeeded in working loose a thong from my snowshoe and tying his forelegs; whereupon he imediately flopped on his side and brought his hind legs into play. He ripped off my jacket and a good portion of my trousers before I finally succeeded in tying all four feet together and rolling him off my snowshoes. As the tide of battle had now turned in my favor I sat up and took account of stock, just as the impending storm broke in all its fury with high winds and a heavy fall of snow. It was difficult for me to distinguish even the buck as he lay struggling in the snow. I had a long cut on my left wrist, my clothes were nearly torn off, and my compass had disappeared. The thing that worried me most, however, was how to get my snowshoe thong from his feet and make a graceful getaway. Finally, after much thought, I placed both snowshoes on the hard trodden deer run. Quickly untying the thong from the buck's legs I jumped on the shoes and with a few rapid strides was at a safe distance. The deer, however, not to be so easily outdone, made several nearly successful attempts to follow, and mix it up again, but the deep snow was too much for him. He gave up in disgust. By this time it was dark and I had lost my compass as well as my sense of direction. By taking the line of least resistance, which happened to be down hill, I was fortunate enough after an hour of slow and difficult traveling to stumble upon a small but solidly built log camp. It was abandoned but fortunately contained a quantity of dry grass and leaves. I lost little time in burrowing into the hay, to be lulled to sleep by the howling storm outside. The next morning dawned bright and clear and I easily located my own camp, where, after a good breakfast, I made several necessary repairs to my clothes as well as my person.



Keeping Up With Mary

A long-legged sheep in the Himalayas is able to run forty miles an hour. That's the kind of little lamb to follow Mary nowadays.—*Arkansas Gazette.*

Sanctuary!

Why doesn't Chicago come right out in the open and admit it's a refuge for the protection of wild life?—*Arkansas Gazette.*

What About a Sheep-skin

The president of Dartmouth says too many young people go to college. After all, there are only so many raccoon coats in the country.—*Detroit News.*

Devious Pome

The following was copied from the visitors' register at the Mt. Herman Camp Ground in Colorado. It refers to the Mt. Herman road, a Forest Service project:

"Winding in,
Winding out,
It fills your mind
With serious doubt
As to whether the guy
Who built this route,
Was going to hell
Or coming out."

Its Brand

Somewhere in Alaska there has been discovered a prehistoric monster imbedded in a cake of ice. Its head is said to be camel-shaped and its body like that of a fish. Probably just another political straddle that was left out in the cold.—*Boston Herald.*

Duck: "Holy mackerel! What next!!!"

Constant Reminder

A scientist states that there are billions of millions of moons. Not once in a blue one are we allowed to forget it by the song publishers.—*London Opinion.*

Perfect Behavior

An angler, who had been trying to hook something for the last six hours, was sitting gloomily at his task, when a mother and her small son came along.

"Oh!" cried out the youngster, "do let me see you catch a fish!"

Addressing the angler, the mother said, severely: "Now, don't you catch a fish for him until he says 'Please!' "—*Tit-Bits.*

Making Their Mouths Water

"What! A little squib like you a wild animal trainer?"

"My small size is the secret of my success. The lions are waiting for me to grow a little larger."—*Pitt Panther.*

Pardon!

It usually takes five years for a tree to produce nuts, but this isn't true of a family tree.—*Detroit Free Press.*

His Advantage

Mammals are classified thus: Man and the lower animals. Man does the classifying.—*Anaheim Plain Dealer.*

Skinned!

A scientist says that a polar bear has nature's best winter overcoat. The moths have mine.—*Judge.*

Discovered!

A backwoodsman mountaineer one day found a mirror which a tourist had lost.

"Well, if it ain't my old dad!" he said, as he looked in the mirror. "I never knowed he had his pitcher took."

He took the picture home and stole into the attic to hide it. But his actions didn't escape his suspicious wife. That night while he slept she slipped up to the attic and found the mirror.

"Hm-m," she said, looking into it, "so that's the old hag he's been chasin'."—*Exchange.*

Not Even a Swallow?

Audubon societies say birds will take naturally to golf-course sanctuaries, but we've never been able to get a birdie on one.—*Detroit Free Press.*

Speak Up, Florida!

A scientist says there is no such thing as a perfect climate. Californians will retort that there is no such thing as a perfect scientist.—*Passaic News.*

Happy Hunting Grounds

A government hunter in Arizona has killed 2,300 coyotes, 700 bobcats, twenty-eight wolves, and eighteen mountain lions. He should be transferred to Chicago.—*Chicago Evening Post.*

Going to the Dogs

The tragedy of the flea is that he knows for a certainty that all his children will go to the dogs.—*Annapolis Log.*

Brain Fodder

Fish, we are told, is not really brain food. Any angler, however, is proof that medium-sized specimens have an extremely stimulating effect on the imagination.—*The Humorist.*

—And She Might Be Right

And now comes the young sweet thing, says Sapling Sam, who thinks a nut tree is one in which endurance contests are held.

Exchange

Science in Siberia has discovered an elephant that has been petrified for 40,000 years, and we can't help wishing that the people in the apartment above ours would trade their pair for this one.—*Detroit News.*

National Timber Board Plans Survey of Forest Industries

A survey of conditions and trends in the forest industries was decided upon by President Hoover's National Timber Conservation Board at its first meeting at Washington, D. C., January 7, with the view of formulating a policy of forest perpetuation and stabilizing industries based on the use of timber, it was announced.

The Board was appointed by the President in December to deal with economic conditions of overproduction which threaten the security of the forest industries and obstruct private practice of forestry. Secretary of Commerce Lamont is Chairman of the Board, which also includes Secretary of Agriculture Hyde and Secretary of the Interior Wilbur.

The announcement of the selection of members of an advisory board, with R. Y. Stuart, Chief of the United States Forest Service, as chairman, to assist in assembling data out of which a definate policy of conserving the nation's forest resources may be formulated, was also made.

Among the specific topics which the Board plans to consider are problems of taxation of timber and forest lands; sale and use of publicly-owned timber, especially National Forests, Indian timber reserves, and state forests; economic cause of the prevailing condition of overproduction of forest products and consequent waste of timber, depletion of forest resources, and insecurity of employment in the forest industries; proposals to divert submarginal agricultural lands to commercial forest growing, and appraisal of relative importance of forestry projects.

Initial funds to finance the survey have been secured from private sources, it was stated.

Members of the advisory committee as set up by the Board include E. T. Allen, Portland, Oregon, forest economist, Western Forestry and Conservation Association; Hugh P. Baker, Syracuse, New York, dean of the New York State College of Forestry; Wilson Compton, Washington, D. C., manager of the National Lumber Manufacturers Association; William L. Cooper, Washington, D. C.; director of the Bureau of Foreign and Domestic Commerce; S. T. Dana, Ann Arbor, Michigan, dean of the School of Forestry and Conservation, University of Michigan; Fred R. Fairchild, New Haven, Connecticut, professor of economics, Yale University; W. B. Greeley, Seattle, Washington, secretary-manager of the West Coast Lumbermen's Association; Charles T. Herty, New York City, consulting chemical engineer; D. T. Mason, Portland, Oregon, consulting forester; George N. Ostrander, Glens Falls, New York, president, Finch, Pruyn and Company; Charles James Rhoads, Washington, D. C.; commissioner of Indian Affairs; George W. Sisson, Jr., Potsdam, New York, director of The American Forestry Association; R. Y. Stuart, Washington, D. C., Chief of the United States Forest Service; and J. W. Watzek, Jr., Chicago, of Crossett-Watzek-Gates, Incorporated.

In addition to the three Cabinet officials, the members of the Timber Conservation Board are George D. Pratt, New York, president of The American Forestry Association; John W. Blodgett, Grand Rapids, Michigan; John H. Kirby, Houston, Texas; Paul G. Redington, Washington, D. C., president of the Society of American Foresters; Dr. John C. Merriam, Washington, D. C., president of the Carnegie Institution; Charles Lathrop Pack, Washington, D. C., president of the American Tree Association; L. J. Taber, Columbus, Ohio, master of the National Grange; Carl F. Gray, Omaha, Nebraska, president of the Union Pacific Railroad; D. C. Everest, Rothschild, Wisconsin; past president of the American Paper and Pulp Association; and W. M. Ritter, of Columbus, Ohio.

Foresters Would Aid Unemployed

The construction of fire lines, pruning and thinning of forest plantations, reforesting, and other forestry work on state-owned forest lands was advocated by the Society of American Foresters at its Thirtieth Annual Meeting at Washington, D. C., late in December, as a means to provide work for a large number of unemployed men. State legislatures were urged to make available emergency funds for this purpose.

The Society also approved the preservation of a representative primitive area of the Florida Everglades as a National Park pro-

Group of professional foresters attending the Annual Meeting of the Society of American Foresters at Washington, D. C.

vided the boundaries are drawn so as to include only areas of National Park significance and provided administration seeks to give the greatest possible protection to the primitive associations therein. Other resolutions adopted called for a thorough investigation and study of erosion control and stream-flow regulation on forest and range lands; that federal legislation be enacted to afford a definite legal status as "Indian Forests" all unallotted lands within Indian Reservations that may be found to be primarily adapted to the production of forest crops, needed for purposes of water conservation, or essentially contributory to the prevention of soil erosion; that Congress, the states and private owners provide such appropriations as will make possible immediate and adequate steps to control white pine blister rust.

More than 300 professional foresters from every section of the country took part in discussions and heard papers dealing with private forestry enterprises, their progress and accomplishments, the public land policy of the United States, and the field of forestry.

Among the speakers were Henry Solon Graves, dean of the Yale Forest School; Raphael Zon, director, Lake States Forest Experiment Station; Dr. John C. Merriam, president, Carnegie Institution of Washington; R. Y. Stuart, chief forester, United States Forest Service; Ellwood Wilson, head forester, Canadian Power and Paper Corporation; W. E. Hiley, Imperial Forestry Institute, Oxford; M. Louis Duplaquet, Inspecteur-Apoint des Eaux et Forets, Nancy, France; S. B. Detwiler, office of Blister Rust Control; Henry R. Francis, New York State College of Forestry.

Transfer of Public Domain Advocated

Transfer of the Public Domain to the states will be recommended to President Hoover by his Public Lands Commission, according to an *Associated Press* dispatch of January 20. Although Chairman Garfield or other members of the Commission refused to comment on their report, it was said that the transfer would be subject to a request by state legislatures that the land be turned over to them, and would provide for reservation by the government of acreage for National Forests, reclamation projects, power sites and other purposes.

The report is said to be similar to the tentative draft reached by the Commission at its November session.

There are approximately 178,000,000 acres now owned by the government, lying in the eleven public lands states whose representatives formed the majority of the committee. Seven eastern states were also represented on the committee.

According to the dispatch, the committee recommends that if the legislatures do not ask for the lands that areas be set aside as national ranges, under the control of the Forest Service.

It also recommends consolidation of the government agencies concerned with the administration of national reserves and the conservation of resources and suggests legislation to that end.

Refinancing of irrigation districts was frowned upon in the report, which suggested that the income from power systems upon reclamation projects launched by the government should be paid into the Bureau of Reclamation.

Mineral rights in known mineral areas would remain with the government, but subsoil rights elsewhere would be transferred to the states.

A policy of governmental flood control measures was advocated. The Boulder Canyon project was named as an example of the type for which flood control steps should be taken.

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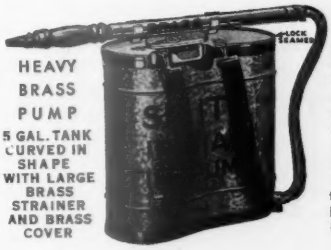
Frank Ray (signed)
Chairman of the Board



The tank of the INDIAN, being curved in shape, fits the carrier's back and does not slide around as he advances through brush. Extra strong in construction, Smith fire pumps are used by U. S. and State Forest Rangers.

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New Bird Refuges Authorized

The Migratory Bird Conservation Commission has authorized purchases of lands by the Biological Survey for migratory game-bird refuges in Florida, California, North Carolina and Nebraska, aggregating 73,780 acres. The cost to the Government will average $5.28 an acre.

The four proposed refuges had been surveyed previously by biologists and land valuation experts of the Biological Survey and the Department of Agriculture had approved their acquisition as units in the nation-wide system of refuges authorized by Congress.

The new Florida refuge will extend about twelve miles along Apalachee Bay, in Wakulla, Jefferson and Taylor Counties, and will be known as the St. Marks Migratory Bird Refuge. It will contain 13,981 acres. The new purchases in California will add 8,982 acres to the Salton Sea Wild Life Refuge. The purchase authorized, together with the public lands recently set aside by the President, will create a refuge of more than 24,715 acres for waterfowl and other migrants in the Imperial Valley.

The Swanquarter Migratory Bird Refuge will be established in North Carolina under the new authorization. This will consist of 11,778 acres in Hyde County, on Pamlico Sound, and together with intermingled areas of water will make an administrative unit of about 20,000 acres.

In the sandhills of western Nebraska the purchase of 39,038 acres is authorized for the establishment of a migratory bird refuge in an area resorted to by great numbers of waterfowl in the nesting season. This is in Garden County and will be known as the Crescent Lake Migratory Bird Refuge.

The Migratory Bird Conservation Commission, which was created by the act providing for a ten-year program of refuge acquisition consists of Secretary Hyde of the Department of Agriculture; Secretary Lamont of the Department of Commerce; Secretary Wilbur of the Department of the Interior; Senator Norbeck, of South Dakota; Senator Hawes, of Missouri; Representative Ackerman, of New Jersey; and Representative McReynolds, of Tennessee. Rudolph Dieffenbach, in charge of land acquisitions of the Bureau of Biological Survey, is secretary of the Commission.

Big Game Animals Increasing in National Forests

That most types of big game continue to increase in the National Forests is shown in the latest game census by the Forest Service.

In the last five years the estimated number of antelope in the National Forests has increased thirty-five per cent; of black or brown bears, nine per cent; of deer, thirty-two per cent; of elk, fifteen per cent; of mountain goats, eighteen per cent; and of mountain sheep, two per cent, with decreases of thirty-seven per cent in grizzlies, eighty-six per cent in caribou, and fifteen per cent in moose. Unless more protection is afforded to the grizzly, says the Forest Service, other states will be in the class of California, where this animal is now extinct. The decrease in caribou is owing largely to the disappearance of the herd on one forest adjoining Canada, and it is assumed the herd has shifted its range to Canada. More reliable estimates account for the apparent lower number of moose, as early estimates were too high, the Forest Service believes.

The Forest Service game estimates, as of January 1, 1930, showed that Alaska had most of the 3,500 grizzlies (including Alaska brown bear) remaining in United States National Forests. Montana had approximately 520, and Wyoming and Idaho more than 100 each. Idaho, Montana and Wyoming had most of the 5,150 moose. Elk were numerous in many of the National Forests of the northern Rocky Mountains, 82,670 being listed, with more than 28,700 in Wyoming. National Forests in North Carolina, Oklahoma, Pennsylvania, Virginia and several other states had small herds.

There were more than 50,000 black and brown bears, the California National Forests leading with 17,400. Approximately 21,050 mountain goats, 12,300 mountain sheep, and 10,200 antelope were found in western National Forests. Beavers numbered approximately 106,660.

Of big game animals, deer were most numerous, a total of 802,450 being reported in National Forests of twenty-three states and Alaska. California led with 254,000, and Alaska, Arizona, Idaho, Montana, New Mexico and Oregon had more than 50,000 each.

Forest Land Deeded to God

When Peter E. Armstrong, a Pennsylvania farmer, deeded, with due formality sixty-five years ago, 600 acres of forest land to God he put a delicate problem up to the local assessor and tax collector. Mr. Armstrong refused to pay the taxes, because he contended that man was intended to enjoy the blessings of the world but not to claim title to them; the taxes were not forthcoming from any other source. Consequently, the land was sold at tax sale, reverting to this public function at least three times during the last forty years.

The deed which Mr. Armstrong drew up and which was signed by him and his wife, Hannah, has been pronounced a remarkable combination of technical accuracy and literary and spiritual beauty.

Forest Insects Thrive in Wake of Drought

Drought has weakened forest trees in many parts of the country this year and the United States Department of Agriculture reports armies of bark beetles following in its wake and preying on weakened trees. The beetles are not only killing many trees, but they are reenforcing their ranks for a threat against timber next year.

Damage by drought and beetles together is particularly severe throughout the southern Appalachian Mountains. An appreciable percentage of the pine timber throughout most of the region near the junction of Tennessee, North Carolina and Virginia is dying. Large patches on mountain sides, normally green with pine at this time of year, are now red or brown. Many hickory trees likewise suffered from the drought and beetles have attacked them. Reports from Ohio and other North Central States show that drought and insects together have killed many hardwoods there.

Drought alone killed some trees, but in most cases beetles have added the finishing touches. Bark beetles do not attack vigorous trees when there are enough weakened ones to satisfy their appetites.

Entomologists of the Division of Forest Insects suggest that unless subzero, killing temperatures occur during this winter precautionary measures should be undertaken in order to prevent the development and possible spread of the beetles next spring and summer. These measures consist of destroying, by burning, the developing beetles present in and under the bark of infested trees left in the woods, or present in slabs left at the sawmill. Dying trees should be cut first to get the beetles. Dead trees can wait, for the tree-killing insects have already left them.

State Forest Laws Strengthened by Recent Legislative Acts

Forestry laws were strengthened materially in several states last year, according to a review of recent state forestry legislation reported by the Forest Service.

The three preceding years saw much progress and the adoption of strong forest policies in several states, says the Forest Service. Tax laws were amended, planting was provided for, acts enabling Federal participation, and acts for acquisition of lands for state forests were passed in some states. Fire protection was strengthened in many Southern States.

Several states made changes last year in laws relating to forest taxation. Kentucky substituted for its previous forest-tax law, which had been declared unconstitutional, a leasing provision as part of a new law for the establishment of forest reserves suited to the growth of timber and the propagation of wild-animal life. New York amended her tax law by extending its application to all forest plantations instead of only to plantations made since January 1, 1921, and by providing that at no time shall the land be assessed at a higher valuation than that at the time when classification was or may be applied for.

Virginia provided that, subject to county approval, the Department of Conservation and Development may set up forest, game, fish and recreation reserves, comprising private forest lands or lands suited to the growth of timber, whose owners may offer them for this purpose. The landowners obtain a postponement of the payment of taxes, with interest at six per cent, for not longer than forty years; or alternatively they may pay all taxes annually, and receive annually one-half of the receipts from the sale of hunting, fishing and recreation privileges. Virginia created a temporary commission to investigate forestry and forest taxation, to study the different methods of promoting forestry in the various states, including methods of taxing forests and waste lands, and to report its findings and recommendations by January 1, 1932. Wisconsin amended its income tax law to allow the deduction from income of expenditures for planting or protecting a forest crop on lands registered under the forest-crop law.

Several states strengthened their forest-fire legislation. Kentucky provided that if owners of private forested lands fail to provide a sufficient patrol the state will furnish such protection at a charge of not to exceed 1 cent per acre per year. This provision does not apply to members of the various fire-protective associations now in existence. The penalties for unlawfully causing forest fires were made more severe, and some acts made mutilation or removal of posted notices of the State Forest Service a crime punishable by fine or imprisonment or both. Massachusetts gave the State Forester power to order forests to be put under patrol by the town wardens at times of extreme drought with partial state reimbursement of the cost, and also strengthened the restrictions on setting fires in the open air. Massachusetts also made it an offense to throw a lighted cigarette, cigar, match, ashes, or flaming substance from any vehicle, where it is likely to cause a forest fire. Mississippi made all county sheriffs reforestation wardens who are charged with duties that include enforcing the state reforestation laws and all rules and regulations of the state forestry commission. The state also gave them authority to call on any citizen in a forest-protection area to assist in preventing or controlling forest fires.

An amendment to the New York State constitution giving power to contract debts for the suppression of forest fires was adopted at the last general election. Virginia made refusal or failure to assist in fire fighting when summoned by fire wardens a misdemeanor.

Federal land acquisition for National Forest purposes was given a broader field in Wisconsin, which increased the maximum from 500,000 to 1,000,000 acres; and also in Georgia, which amended the enabling act to include the Okefenokee Swamp.

Kentucky authorized the governor to accept donated lands as state forest reserves, to be administered by the State Forest Service. Massachusetts increased the maximum acreage of lands to be acquired for state forests by 50,000 acres. Texas appropriated $25,000 to purchase virgin state forest land in the longleaf-pine section of the state.

Virginia provided that by proclamation of the governor tax-delinquent lands bid in by treasurers for the benefit of the state, and certain waste and unappropriated lands of the commonwealth chiefly valuable for forestry purposes, may be set apart permanently as state forest land. Wisconsin empowered the Conservation Commission to sell state lands and use the funds for blocking up state or county forest lands; authorized the state or any county to exchange land for other lands, whether publicly or privately owned; increased the powers of county boards to acquire county forests; amended the county zoning law to cover areas to be used for agriculture, forestry and recreation; and relieved counties taking tax deeds from the necessity of satisfying the tax claims of the state prior to sale of the land or, if the land is entered under the forest-crop law, until the forest crop is taken off.

Georgia required that instruction in the practical value of conserving and protecting forests be included in the curriculum of the state public schools.

In New York an amendment to the state constitution was initiated to assure adequate appropriations to make fully effective the state's enlarged reforestation program by providing $19,000,000 over a period of 11 years, for the acquisition and reforestation of land and the management of the forests.

Government Wants Junior Foresters

The United States Civil Service has announced open competitive examinations for junior foresters and junior range examiner for vacancies in the United States Forest Service. Entrance salaries are listed at from $2,000 to $2,600 a year. Applications must be filed at Washington, D. C., not later than March 10, 1931, it was announced.

The duties of the appointees will be in subordinate work on such line of work as timber sales, scaling and marking timber; improvement in the construction of roads, trails and other engineering works; timber cruising and mapping; forestation, both nursery and planting projects; protection from fire, insects and diseases; wild-life management; ranger district administration; and research in silviculture, products, range management and economics at forest and range experiment stations.

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Book News and Reviews

THE MAINTENANCE OF SOIL FERTILITY, by Charles E. Thorne, published by Orange Judd Publishing Company, New York City; 332 pages; illustrated. Price $3.

Although prepared primarily for the agriculturist, this book contains basic information of value to foresters. Foresters who are involved in nursery activities must be especially intimate with the principles and means by which their nursery soils may be maintained in a high state of fertility. This book will be particularly valuable to them, for it represents the results of a lifetime of research and survey by Dr. Thorne, for more than thirty years Director of the Ohio Experiment Station.—*G. H. C.*

TELLING ON THE TROUT, by E. R. Hewitt. Published by Charles Scribner's Sons, New York. 216 pages, illustrated. Price, $2.50.

Written by a real sportsman, this book is far beyond a manual of trout fishing, answering some questions that linger with the tried and true fisherman. To read it is to chat rather intimately with a fisherman who knows his rod and reel—and that is always a pleasure.—*E. K.*

Wood Utilization Report in Panama Canal Zone—Recommended revision of lumber specifications and the putting into practice in the Canal Zone of the latest developments in wood utilization are exhaustively discussed by Axel H. Oxholm, Director of the National Committee on Wood Utilization of the Department of Commerce, in a report transmitted to Colonel Harry A. Burgess, of the Panama Canal.

GARDEN POOLS, by L. W. Ramsey and Charles H. Lawrence. Published by the MacMillan Company, New York. Illustrated. Price, $2.50.

Though essentially for one who wishes to build a garden pool, this book presents attractive ideas to one with more pretentious estates. For formal and informal gardens there is shown by means of pictures and text how and where to place water features in the landscape scheme, how to build lily pools and how to plant the water garden and stock it with fish and aquatic plants.—*P. V. G.*

"Porcupine Control in the Western States," Leaflet No. 60, by Ira N. Garbrielson, Assistant Biologist, and E. E. Horn, Associate Biologist, Division of Predatory-Animal and Rodent Control, Bureau of Biological Survey.—A brief description of the habits and movements of western porcupines, together with directions for poisoning them.

THE FISHERMAN'S SAINT, by Sir Wilfred Grenfell. Published by Charles Scribner's Sons, New York. 56 pages. Price, $1.

An adventurous philosophy of life is presented by the famous "Labrador Doctor" in this volume, that will fit existence in the Arctic or at a city desk. He takes as his guide, Andrew, the patron saint of fishermen. It is worth several hours of every fisherman's time.—*E. K.*

"Management of Farm Woodlands in Louisiana," by Gordon D. Marckworth and Robert Moore, Bulletin 209, Louisiana State University, Baton Rouge.—Compilation of timberland experiences in various parts of Louisiana covering the past ten years. Photographs illustrate good and bad practices and diagrams show how to illustrate the proper methods of thinning a stand. The bulletin is prepared especially for farmers, but gives an idea of forest conditions in Louisiana and the extent to which the practice of forestry has been proved possible.

"Fertilization of Shade Trees, Part II—Chemical Fertilizers for Conifers," by Homer L. Jacobs, Bulletin No. 5 of the Research Department, Davey Tree Expert Company, Kent, Ohio.—A discussion, with illustrations, of the work conducted during two years on the use of chemical fertilizers with cone-bearing evergreens. The results are not conclusive but show that nitrogen fertilizers stimulate Norway spruce to better growth and result in a much more beautiful dark green coloration.

CLASSICS OF THE AMERICAN SHOOTING FIELD, by John C. Phillips and Lewis W. Hill. Published by Houghton Mifflin Company, Boston. Illustrated. 214 pages. Price, $7.50.

One of the finest collections of sketches that have appeared in American shooting literature since its beginning. Of special interest are the illustrations, which have been taken from the pages of the older books on shooting, from the quaint works of Currier and Ives, and from the drawings of Frank W. Benson. Beautifully printed, it is sure to interest sportsmen because of its historical associations and picturesque flavor.—*E. K.*

"Making a Model to Show How Forests Prevent Erosion." Leaflet No. 85, U. S. Department of Agriculture.—Describes the making of a model to show the devastating effect of rainfall upon steep hillsides from which forests have been removed, as compared with similar hillsides upon which the tree growth is retained.

Porto Rico Nurseries Increase Production

With no increase in nursery expenditures, the Porto Rico Division of Forestry produced about forty per cent more forest planting stock in the year ending with June, 1930, than in any preceding year. The increase in production was effected mainly through a cut in the number of species produced. With about thirty-five of the species used in recent years eliminated, sowings in the nursery were principally of about forty species known to do especially well in Porto Rico. This year the number of species grown may be further reduced.

At one time and another nearly 500 species of forest trees have been grown in the Porto Rico nurseries and sent out to various sections of the island for trial.

The total output of the insular nurseries for the fiscal year 1930 was 1,366,275 trees. Of this number 141,059 were planted on insular forests, 25,938 were distributed to schools for Arbor Day planting, about 48,000 were used for roadside planting, and the remainder were distributed to private individuals, free of charge, for planting on their own land. About one per cent of the total output were distributed for planting as ornamentals on private land, on the theory that to familiarize the public with the rapidity of tree growth in Porto Rico will stimulate public interest in forest planting.

In periods of exceptional drought during the past year several men were kept busy day and night watering the beds in the insular nurseries, with the result that no unusual losses occurred.

Twenty new concrete seed beds were constructed in the forestry division's principal nursery, at Rio Piedras, during March and April, increasing its average seedling capacity to 900,000 a year. This nursery contains 405 transplant beds which have an annual capacity of about 200,000 trees.

Pennsylvania Trees Grow Forty Days a Year

Another popular belief will soon go by the boards, if conclusions drawn by State Forester Joseph H. Illick, of Pennsylvania, after extensive experimental studies of growth are correct.

"The belief is prevalent," says Dr. Illick, "that trees grow throughout the general growing season, which in Pennsylvania embraces from one hundred fifty to two hundred days, and extends from the last killing frost in the spring to the first killing frost in the autumn.

"This is a mere supposition for most of the native and introduced forest trees in the Mont Alto State Forest, Franklin County, were found to make ninety per cent of their height growth in less than forty days."

Fish and Game Associations Not Taxable

An association organized to aid in the enforcement of fish and game laws, to introduce new species and varieties of game and to disseminate information relative thereto is exempt from tax as a corporation, according to a recent ruling of the Department of Internal Revenue. Such an organization, supported entirely by membership dues which are expended for operating expenses, may be classified as an educational institution.

Champion Fibre Lands in Great Smoky Park Areas Valued at $2,325,000

A valuation of $2,325,000 was placed on the timberlands of the Champion Fibre Company in the Great Smoky Mountains National Park area, in Tennessee, recently by the jury of view in the condemnation suit brought by the State of Tennessee to acquire approximately 39,000 acres as part of its contribution to the National Park. An award of $225,000 for "incidental damages" to the company's $10,000,000 pulp mill at Canton, North Carolina, was also made, bringing the total to $2,550,000.

That the State will take a non-suit or appeal the case to a circuit court jury was indicated by D. C. Chapman, chairman of the Tennessee Park Commission, who pointed out that the State had only $1,900,000 to purchase all tracts to be acquired for the park.

The jury's report, fixing the valuation of the timberlands at $2,325,000, is approximately mid-way between valuations set on the property by the Champion Fibre Company and the State of Tennessee.

Danish State Forests Profitable

The state forests of Denmark, according to the Director of State Forestry, showed a net income of 54 cents per acre during the fiscal year 1928-1929. This, income after taxes and other expenses were paid, represents the return from 168,831 acres, and totaled $91,169. Much of the forest land is in the heath district and was taken over by the government after it had been abandoned for agriculture. The timber cut for the year was 8,789,650 cubic feet, or 52 cubic feet per acre.

A severe and snowy winter interfered with transportation, but gross expenditures for the year were $779,014. The forests have served as an economic balance-wheel in that they furnish employment for labor when times are otherwise slack. Wood from the state forests is cut and piled at the roadside where it sells for $4.50 to $9 per cord.

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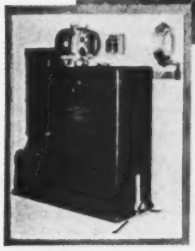

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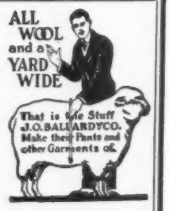

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Nut Tree Council Meets

At the meeting of the Council of the National Nut Tree Planting Project held in January, the program for 1931 was outlined. The collection of nut seeds next fall was recognized to be of prime importance in order to secure the quota necessary to furnish seeds for this forestry program calling for the planting of 5,000,000 nut trees in five years. Due to the shortage of nuts in 1930 brought about by the drought, it was estimated that it will be necessary to collect between 3,000 and 4,000 bushels next fall, and an aggressive campaign was authorized to be begun immediately to accomplish this purpose. As a first step in obtaining the amount, plans were made for a survey to locate nut trees on historic grounds. The homes of men and women of state and national fame, memorial parks and grounds, and all places of historical interest will be canvassed for nut-bearing trees, and the cooperation of state and extension foresters will be solicited. C. A. Reed, chairman of the Council and expert on nut culture of the United States Department of Agriculture, presided at the meeting, which was held in The American Forestry Association Building, headquarters of the project; O. H. Benson, Director of Rural Scouting of Boy Scouts of America, G. H. Collingwood, Forester, and Ovid Butler, Executive Secretary of The American Forestry Association, were present.

Trees Planted by Airplane in Hawaii

Planting of a forest by broadcasting seeds from an airplane has been part of the forestry work in Hawaii. Hawaiian foresters planted 298,650 trees in the territory's forest reserves last year, according to a report of the Hawaiian Commission of Agriculture and Forestry just received by the Forest Service. One hundred and forty-seven kinds of trees were planted—ash, oaks and paperbark leading, and the California coast redwood coming fourth, with 23,392.

A large eroded area was sown to a mixture of tree seeds by airplane, a United States Army plane broadcasting 1,689 pounds of seeds from an elevation of 2,000 feet.

Pacific Coast Forest Conference

The annual meeting and Pacific Coast Forest Conference of the Western Forestry and Conservation Association will be held in Spokane, Washington, March 19, 20 and 21, with headquarters at the Davenport Hotel, it has been announced.

The first day will be devoted to protection and education. So much interest is being taken in protection equipment that it may be decided to hold a complete equipment show as an adjunct of the conference, it was stated. The two general-session days will cover important phases of forest growing and protection, probably with special emphasis on economic problems bearing upon forest land ownership and cooperation in protective organization. The program will be influenced both by Inland Empire conditions and by the approaching investigation by President Hoover's recently appointed Timber Conservation Board.

Vermont Reports on Forestry

The biennial report of Perry H. Merrill, Commissioner of Forestry for the State of Vermont, includes a summary of progress during the past twenty years. Areas in state forests have increased from one of 525 acres to nineteen of 37,134 acres. Exclusive of the many gifts of forest land to the state, the average price paid for these areas is $2.83 an acre. In addition there are now forty-two municipal forests, aggregating 8,919 acres, on which the people have planted 2,115,350 trees. Nearly half of these forests are maintained for the expressed purpose of protecting a watershed.

In 1907 there were 35,000 trees planted in Vermont. By 1930 this number had increased to over 20,000,000 trees, of which 1,825,821 were planted in 1930.

There were 101 forest fires during 1929, covering a total of 927 acres, and costing $1,747 to control. The total damage of nearly $3,000 was most excessive during April. The record of 1929 was exceeded during the first six months of 1930 because of the excessive dry spell. Up to May 23 there had been 216 fires which burned over 6,243 acres.

To protect approximately 2,750,000 acres of forest land, Vermont expended $21,293 in 1930. Of this amount the Vermont Timberland Owners Association contributed $5,214, the Vermont Forest Service $8,385, and the Federal Government, under authorization from the Clarke-McNary Act, $7,694.

States Receive National Forest Revenues

Twenty-eight States, Alaska, and Porto Rico will share to the extent of $1,677,559 in the receipts of the National Forests for the fiscal year 1930. This amount represents twenty-five per cent of the total net receipts, and checks have been mailed from the Treasury Department to the individual States, according to the United States Forest Service.

Net receipts of the National Forests last year increased in the aggregate nearly $500,000 over the preceding fiscal year. The twenty-five per cent return to the states is allotted in proportion to the receipts realized from National Forests within each state. A state's share of National Forest receipts represents a Federal payment in lieu of taxes. As provided by Federal statute, the funds are turned over to the counties containing National Forest lands, to be used for schools and roads.

Besides the twenty-five per cent fund, an additional ten per cent of forest receipts is set aside each year to be used for forest roads. The ten per cent fund this year will provide $671,023 for building roads and trails within national forest boundaries, supplementing the regular appropriation made by Congress for this purpose. This year the Federal Government is spending $12,500,000 for National Forest roads and trails. Fire protection, planting, and other improvements which will maintain and increase the productivity of the forests require other large amounts.

Many Lost in Northwest Forests

Fifty-seven people were lost in the National Forests of Oregon and Washington during the past summer, according to the United States Forest Service. This number is unusually high, it was pointed out, due to the increasing number of inexperienced people entering the forests.

It cost the Government about $12 to search for each one of the lost people, seventy-four rangers taking part in the man-hunts, working a total of ninety-seven days. Among the people lost were men, women and children, including an old lady, a policeman and a good many hunters.

Forest officers in the Northwest are seeking to discourage people from entering the forests this winter unless they are experienced with snow and low temperatures at high elevations or are accompanied by someone experienced in such conditions.

Association Elects Officers

The election of officers of The American Forestry Association for the year 1931 has been announced as follows:

George D. Pratt, New York, was reelected President. C. Arthur Bruce, Tennessee, Director of the National Hardwood Manufacturer's Institute, was elected a Director to fill the place of Frank O. Lowden, Illinois, former Governor of Illinois, whose term expired; Joy Morton, Illinois, founder of the Morton Arboretum, was elected a Director to fill the unexpired term of John C. Phillips, Massachusetts, of the Massachusetts Fish and Game Association; F. W. Besley, Maryland, State Forester of Maryland, was reelected a Director.

Mrs. Herbert Hoover, Mrs. Francis E. Whitley, Iowa, General Federation of Women's Clubs, and Joseph Hyde Pratt, North Carolina, President of the North Carolina Forestry Association, were reelected Vice-Presidents. The new Vice-Presidents elected were Stanley Coulter, Indiana, Conservation Commissioner of Indiana; Dr. Henry S. Drinker, President Emeritus, Lehigh University, Pennsylvania; Dr. David Fairchild, Florida, agricultural explorer, United States Department of Agriculture; Glenn Frank, Wisconsin, President of the University of Wisconsin; James R. Garfield, Ohio, Chairman, Commission on Conservation of the Public Domain; Allen Hollis, New Hampshire, President of the Society for Protection of New Hampshire Forests; Posey N. Howell, Mississippi, of the Mississippi Forestry Commission; Stafford King, Minnesota, American Legion; R. A. Long, Missouri, Chairman, Board of Directors, Long-Bell Lumber Company; Mrs. J. Willis Martin, Pennsylvania, Garden Clubs of America; Jack Miner, Canada, wild life protector; Dr. E. W. Nelson, Washington, D. C., former Director, United States Biological Survey; Peter Norbeck, South Dakota, United States Senator; Arthur H. Vandenberg, Michigan, United States Senator; George E. Vincent, Illinois, President of the Izaak Walton League of America; Philip Weyerhaeuser, Idaho, General Manager, Clearwater Timber Company; William M. Wheeler, California, President of the California Forest Protective Association; and Sinclair Wilson, Oregon, Chairman Forestry Committee, Oregon State Chamber of Commerce.

Tariff Provisions for Admittance of Game and Birds Announced

Regulations governing the free entry of game animals and birds, and of live game animals and birds for stocking purposes, as well as such game and birds killed by United States residents, are promulgated in a decision just made public.

The Tariff Act of 1930, states the decision, provides for the free entry of live game animals and birds, imported for stocking purposes, and game animals and birds killed in foreign countries by residents of the United States, and imported by them for noncommercial purposes.

Pursuant to the law, it is determined that deer and elk, rabbits, squirrels, ducks and geese, bustards and tinamous are the classes of live game animals and birds which may be admitted free of duty for stocking purposes, without reference to the Bureau of Customs.

Application for the free entry of other live animals or birds should be referred to the Bureau of Customs for consideration. Animals imported for fur farming purposes should not be admitted free of duty under that paragraph.

There shall be filed with the entry a declaration by the importer or his agent. If the declaration is signed by an officer of the Federal or a state government, or a person who shall present to the collector an order for the shipment given him by the Federal or a state government, a statement as to the place of delivery shall not be required.

Game animals and birds killed in foreign countries by residents of the United States, if not imported for sale or other commercial purposes, may be admitted free of duty. No bond or cash deposit to insure the destruction or exportation of the plumage of such birds shall be required.

Add to Bryce National Park

Additional canyons of great beauty were recently added to Bryce National Park in southwestern Utah, increasing the park area from 14,480 to 30,560 acres. The additional lands were taken from the Powell National Forest and complete an arc of scenic grandeur that has been likened to a giant rainbow.

Another recent addition has been that of important prehistoric Indian ruins of the Pueblo type to the Aztec Ruins National Monument, in New Mexico. The total area of the monument is now about twenty-six acres. The main feature of the Aztec Ruins National Monument is a large E-shaped structure containing approximately 500 rooms, twenty-four of which are still intact.

New Jersey Taxes Signboards

A tax of three cents a square foot on outdoor advertising and an annual license fee of $100 for all companies or individuals is the result of an act passed by the New Jersey State Legislature and effective since January 1, 1930.

According to Harold G. Hoffman, Commissioner of Motor Vehicles in New Jersey, over 4000 obsolete and illegal signs have been removed in two counties as a result of the law. In addition eighty-four large billboards have been eliminated, and seventy-eight others have been relocated to conform with requirements.

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A Half-Breed Pine

A half-breed pine is the latest discovery of the Forest Products Laboratory at Madison, Wisconsin, the putative offspring of a western yellow and a Jeffrey pine. There seems to be no other way to account for the facts in the case.

The parent species are extremely similar, but heretofore there has been a last unfailing means of telling them apart—the odor of the wood or leaf, which means a difference in the chemical basis of the extractives. The oleoresin or "dip" that exudes from a wound in western yellow pine yields terpenes, in other words, common turpentine. That from Jeffrey pine is practically in a class by itself, yielding heptane, an aromatic fluid whose odor suggests lemon extract, and which plays an important part in the preparation of antiknock motor fuel.

Consistently, for these two species, *heptane* has meant "Jeffrey," *terpene* has meant "western yellow." What kind of a tree, then, yields both heptane and terpene? The answer is obvious and the existence of at least one tree of that kind seems definitely proved by recent tests. A number of samples of Jeffrey and western yellow pine dip were being distilled at the laboratory for the California Forest Experiment Station. Most of the samples gave off either straight heptane or straight terpenes, in the regular way. But when one particular sample was distilled, first heptane and afterward turpentine dripped from the spout. It was thought that two dips had got mixed, but another sample, collected with special care from the same tree (supposedly a Jeffrey), again produced the two substances in succession as the temperature of the still was raised.

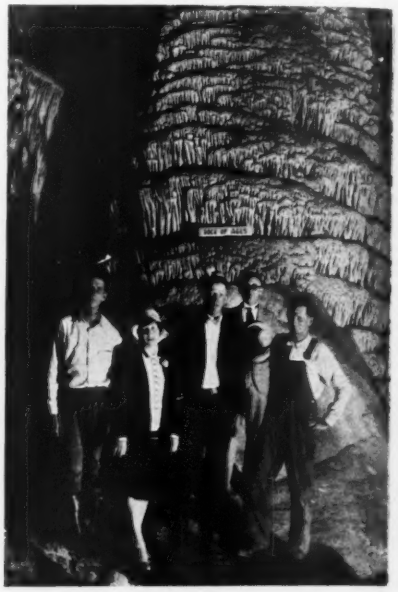
What the forest botanist had suspected was confirmed by the chemist. The tree is a hybrid, a creature of mixed "blood," and as the old saying has it, "blood will tell."

Arkansas Has Statewide Extension School

A statewide Extension School of Forestry was held in Pine Bluff, Arkansas, in December, marking the first time that College of Agriculture, University of Arkansas, has attempted a school of this nature. Two hundred and fifty representatives of various groups in the State interested in the future welfare of Arkansas' timberlands gathered together to hear foresters, lumbermen, bankers, businessmen and farmers discuss various phases of forestry which focused the whole forestry situation and acquainted those attending with something of the program and the relationship that forestry has to both industry and agriculture.

An Underground Gretna Green

The National Park system, among its many scenic and historic marvels, contains a modern Gretna Green, according to the National Park Service of the Department of the Interior. In the Carlsbad Caverns National Park, 750 feet underground, is a huge monolith known as the "Rock of Ages." Here have been celebrated several marriages, among them that of a young woman who promised her mother "never to marry a man on earth." Evidently going beneath the earth absolved her of her promise! The picture shows a happy bridal party which also chose this unusual setting for the ceremony.


The Wedding Party

Forestry Fellowships at California

Two Fellowships giving opportunity for graduate work in forestry and range management and six or more technical assistantships in forestry are now available at the University of California, Division of Forestry.

Interested candidates should communicate directly with Professor Charles B. Lipman, Dean of the Graduate School.

Professor J. W. Stephens Dies

Professor John W. Stephens, head of the Department of Silviculture at the New York State College of Forestry, at Syracuse University, died suddenly January 5.

A native of Michigan, he was graduated from both Michigan Normal College and the University of Michigan, receiving both A. B. and M. S. F. degrees. He was appointed head of the tree nursery at Salamanca, New York, in 1908, taking up his work at the College of Forestry in 1912.

Massachusetts Tree Wardens Meet

The twentieth annual meeting of the Massachusetts Tree Wardens' and Foresters' Association was held at Boston, January 15. The meeting was featured by discussion of the gypsy and brown-tail moth parasites in New England. William A. L. Bazeley, state forester of Massachusetts, and A. F. Burgess, of the Department of Agriculture, were the chief speakers.

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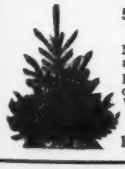

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California Lowers Fire Loss

Favorable weather during the summer months had an important bearing on the 1930 fire season in California. Late spring rains were followed by periods of cool weather. Fire-hazard weather, in which the relative humidity falls below twenty per cent, was of infrequent occurrence and averaged only half as many days as in 1929. September rains also occurred in all forested regions, except southern California, naturally reducing the fire danger in the central and northern parts of the state. The most serious fire of the season occurred in the south during a period of low humidity and high north winds in late October.

According to Regional Forester S. B. Show, the Forest Service, up to October 20, had 1,175 fires that burned over 32,285 acres, costing $215,307 for fire fighting, compared with 1,168 fires, covering 103,266 acres and costing $338,228 for the same period of 1929. This means that in 1930, as compared with 1929, there were about the same number of fires, with one-third of the area burned at two-thirds of the cost. Man-caused fires were reduced from seventy-one per cent of the total in 1929 to sixty-six per cent in 1930. Compared with the ten-year average from 1920 to 1929, inclusive, there were nearly 300 less fires in the National Forests in 1930 and approximately one-seventh of the acreage burned, with a material reduction in fire-fighting expenses.

The State Division of Forestry, up to October 17, had a very successful record as compared with 1929. One hundred eighty thousand acres were burned over in 1,990 fires, against 614,000 acres in 2,239 fires in 1929, and the damage was $427,800 compared to $753,200.

Searching for the cause of this improved fire record over 1929, it is necessary to give a large part of the credit to the weather, says Mr. Show. An analysis of the meteorological conditions from May to September, inclusive, shows that the relative humidity over various parts of the state averaged half as many days below normal as in 1929. This means that the fire hazard was less this past season, and while the weather is not the only factor determining the number of fires that start, it does have an important effect, second only to its effect on the acreage that is burned. Lightning set more fires in 1930 than in 1929 but there were no serious concentrations of such fires except on the Klamath National Forest.

Fires caused by human carelessness also showed a reduction during the 1930 season. Part of this improvement must be credited to the cooperative educational campaign carried on by the Forest Service and State Division of Forestry whereby the message of fire prevention was carried to 43,000 high-school students, forest visitors and citizens of mountain and valley communities. Strict law enforcement for violation of fire regulations, particularly in the National Forests and counties of southern California, where great watershed and recreation values are at stake, has been a powerful factor in teaching care with fire.

One common class of man-caused fires—those set by the throwing of burning tobacco and matches—has been reduced by the establishment of "fag stations" or smoking places in the National Forests, where smoking is forbidden, during the dangerous fire season, and by the removal of all inflammable growth from a strip nine feet wide on both sides of main traveled roads. The California Highway Commission, State Department of Public Works, fireproofed over 1,000 miles of state highways in this manner, during the fiscal year 1930, at a cost of $182,850, and will continue this work as a cooperative project.

THOSE AMONG US YOU SHOULD KNOW

The daily story of the forests is closely linked with names—personalities who are pointing the way in the various phases of the outdoors. Forestry, wild life and related fields all have their great and near great, and it is to better acquaint the public with these interesting people—men and women whose names are familiar—that this feature is conducted every month.

A YEAR ago an invitation was sent out from the Imperial Forestry Institute at Oxford calling upon all persons interested in the systematic anatomy of woods to meet in Cambridge at the time of the Fifth International Botanical Conference. From it resulted the International Association of Wood Anatomists, and Samuel J. Record, professor of Forest Products at the Yale Forest School, was named secretary of its organizing committee. The task before him is to conceive ways and means to advance the knowledge of wood anatomy in all its aspects.

In selecting Professor Record to organize this notable undertaking, the Conference recognized in him one of the best informed men in the world today in International forestry and botany. His tropical work alone is monumental. In charge of the tropical forestry department at the Yale Forest School, he has made extensive studies in Central and South America, as well as England, France and other countries. One of his principal tasks has been the assembling of wood specimens at Yale for systematic study. In the collection there are now nearly 20,000 fully catalogued samples, representing more than 1,800 genera. About 200 are from the type of trees of new species discovered by Yale collectors. This material is now being studied, and selected lots are being sent to specialists in foreign countries. The collection far surpasses in size and variety anything existing in the world today, and full investigation will throw much new light upon a proper classification of plants and will make possible the identification of almost any wood in the world. This gigantic task of collection and analysis was fundamental to a proper understanding and utilization of tropical forests.

Samuel J. Record,
Vitalizer of Tropical Forestry

Professor Record's tropical work has had many ramifications outside the Yale Forest School itself. He is associate in Wood Technology in the Field Museum of Natural History of Chicago, and through this has enjoyed the active cooperation of botanists and wood technologists at the institution. He is associated with the *Museo Comercial de Venezula* and with the Brazilian forestry journal *Revista Forestal*. He is editor of *Tropical Woods*.

In 1924 appeared Professor Record's most important work, *Timbers of Tropical America*. This is the outstanding work today on tree species found in the American tropics. Its publication immediately placed Mr. Record among the leaders of the world's authorities on tropical woods.

In addition to his major works, Professor Record has written a great many popular articles for magazines. From 1913 to 1924 he was managing editor of the *Yale Forest School News*.

His varied career as administrative officer for the United States Forest Service, which he served from 1904 to 1910, professor of Forest Products, and head of the department of tropical forestry has had its inevitable reflection in his value as a teacher. Especially in his chosen field, that of tropical forestry, has he given his subject a standing never held before through the work of any American scholar. Through his success in securing cooperation from students of forestry and from organizations and individuals interested in tropical forests, he has built up a collection and secured a wealth of material found nowhere else in the world.

Professor Record received his B. A. and M. A. degrees at Wabash College, entering the Yale Forest School in 1903. His interest in forestry was aroused through a high school course in botany. During his college years he was a laboratory assistant in botany, and in the year of his graduation he assumed charge of the department.

Entering the United States Forest Service his first assignment was a study of western yellow pine in Montana. Later he was engaged in making working plans and advising timberland owners in the Middle West. In 1906 he was placed in charge of a forest survey in the Ozark region of Missouri. After other and varied assignments in many parts of the country he was appointed supervisor of the Arkansas Forest. In 1910 he was detailed as special lecturer to the Yale Forest School, later resigning from the Service and accepting a position as appointed instructor in forestry at Yale. In 1911 he was appointed assistant professor of Forest Products and spent the summer in study at the Forest Products Laboratory at Madison, Wisconsin. In 1912 he published his first book, *Identification of the Economic Woods of the United States*, since used as a textbook throughout the United States. This was followed in 1914 by *Mechanical Properties of Wood*. In 1917 Mr. Record became professor of Forest Products at Yale.

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Because greater quantities of shortleaf and loblolly pine are needed for reforesting burned areas on New Jersey State forests and because it is difficult to grow these species in the climatic conditions of the Washington Crossing Nursery, near Trenton, a new State forest nursery is to be developed in southern New Jersey. The site chosen is about forty acres of cleared land at Green Bank, Burlington County, on the banks of the Mullica River. A portion of the new nursery will be put in seed beds in the spring of 1931.

The fall inventory of stock at the Washington Crossing Nursery showed 1,600,000 seedlings and transplants available for distribution next spring. One-year seedlings were found to total 2,310,000.

Sulphuric acid is now used on all Norway and northern white pine seed beds at the Washington Crossing Nursery as a preventive of damping off, a pint of the acid being used to each 100 square feet of seed-bed surface.

Idaho Legionnaires Undertake Forestry

The American Legion, Department of Idaho, will cooperate in public forestry educational work under the terms of resolutions adopted at its twelfth annual convention, held at Idaho Falls. The Legion proposes to obtain educational material relating to the forests and forest resources of Idaho from the Idaho State School of Forestry, the state forester, and the United States Forest Service, and through its various posts to distribute this material to Boy Scouts, Camp Fire Girls, chambers of commerce, commercial clubs, and public schools. In accepting its conservation and reforestation committee's report the convention approved recommendations that each post make a study of conservation and reforestation problems of its locality and report its findings to the department, and that the department encourage Idaho municipalities to establish community forests for the protection of watersheds and wild life and for recreational purposes. The report urged that the Legion continue to encourage the planting of trees on school grounds, municipal parks, and playgrounds and along public highways, and recommended reforestation of burned-over and denuded areas by the Boy Scouts, the Camp Fire Girls, and similar organizations.

Eberswalde Forest School Celebrates Centenary

The Eberswalde Forest School, in Prussia, Germany, celebrated this year its hundredth anniversary. Three days of meetings and festivities were attended by 350 or more German foresters and by representatives from Sweden, Finland, Hungary, and the United States. Professor R. R. Fenska, of the New York State College of Forestry, was present and describes an exceptionally felicitous occasion. The speakers accorded special recognition to Professor Schwappach and to the late Professor Wiebeke, remembered for his pioneer work in developing tree seed extraction technique. A part of the exercises was the dedication of a new forest products and soil science building completely equipped for research in those subjects. Another feature was a trip to near-by forests.

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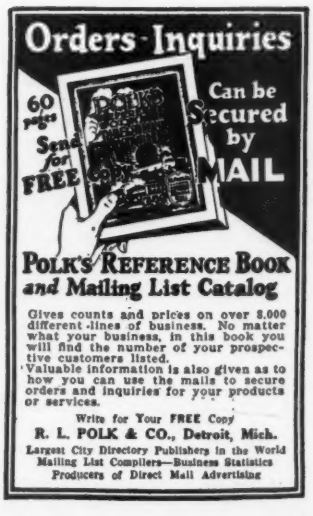
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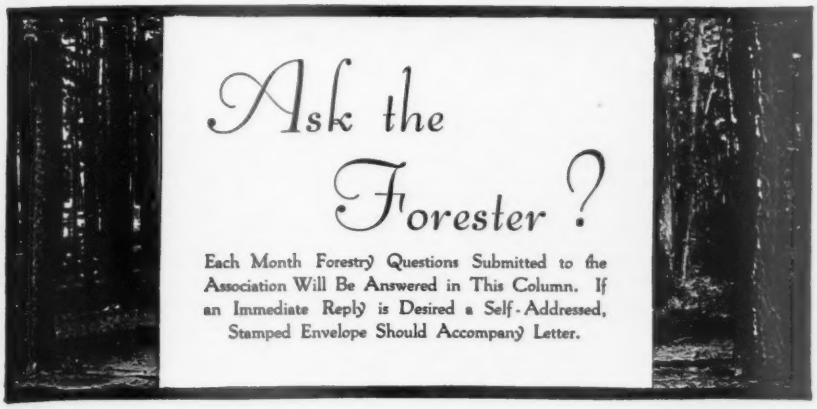

Ask the Forester?

Each Month Forestry Questions Submitted to the Association Will Be Answered in This Column. If an Immediate Reply is Desired a Self-Addressed, Stamped Envelope Should Accompany Letter.

QUESTION: It is said that the chestnut is coming back, as some burrs have been seen, while others say the blight affects the young shoots as soon as they get a foothold. Which is right?—*F. L. S., New York.*

ANSWER: Unfortunately, there is small reason to hope that the chestnut will come back to any extent during the lifetime of any people now living. There remain, however, stands of living chestnut trees in West Virginia, North Carolina and Tennessee, but the trees of New York and Pennsylvania are largely gone. It is true that one occasionally finds young shoots which seem to be getting a foothold, but if they are watched through several years they almost surely will be seen to succumb to the disease. Reports from Pennsylvania indicate a larger crop of nuts than usual, but scientists in the office of forest pathology in the United States Department of Agriculture do not offer any ground for such encouraging statements as you have heard.

QUESTION: Is there a special way to treat black locust seed to encourage it to grow?—*L. W. C., Ohio.*

ANSWER: Black locust seed has a hard thick coat which often retards germination. To offset this some nurserymen pour boiling water over the seeds, and then allow them to stand in the cooling water about twenty-four hours. Others prefer to soak the seed for an hour or so in a dilute solution of sulphuric acid.

QUESTION: What is the value of red maple, silver maple, mountain maple, or striped maple for shade, windbreaks, children's playthings, interior finish and other uses? Which of the maples in Connecticut is the more valuable, and why?—*A. Z., Connecticut.*

ANSWER: Of the several maples listed, red maple and silver maple are the only ones suitable for shade or for the manufacture of lumber, for use in manufacture or interior finish. Of these, red maple is the more desirable and will grow in a wider variety of locations. Each of these trees attains a height of 80 to 120 feet and trunk diameters of three to four feet. Mountain maple and striped maple are both low-growing, bushy trees suitable for ornamental planting in moist shady locations, but of no value for shade or windbreaks. Neither of them attain a size large enough to serve as saw timber.

The most valuable maple in Connecticut is the sugar maple, sometimes called hard maple. This tree attains dimensions comparable with those described for red maple and silver maple but has a wood which is firmer and stronger. It is more generally used for lumber or children's playthings, for flooring, etc., than any other maple.

QUESTION: What is the difference between the paradox walnut and the royal walnut?

ANSWER: Paradox is a group name in common use in California with reference to hybrid walnuts resulting from crosses between the Persian or so-called English walnut, *Juglans regia*, and any black walnut. The term was first used by the late Luther Burbank with reference to a particular hybrid resulting from a cross of the Persian walnut with the Northern California black walnut, *J. hindsi*. Royal is a term similarly originating with Mr. Burbank and applied by him to a particular cross of the California black with the eastern black walnut, *J. nigra*. As with the paradox, the term royal has been extended in its application until it includes all hybrids resulting from crosses between these two species. According to the United States Department of Agriculture hybrids of these sorts are not infrequent as wherever the necessary parent species grow near together and blossom at the same time, crossing is practically certain to take place. Natural hybrids between the Persian and black walnuts grown in the East are fairly frequent, yet the California term paradox is not used in the East.

QUESTION: What causes the heartwood of popple to turn dark in apparently healthy growing trees?—*G. O. H., New Jersey.*

ANSWER: The heartwood of large-toothed poplar (*Populus grandidentata*) frequently turns dark without any material change in the wood structure. This seldom occurs in quaking aspen (*P. tremuloides*). A fungus (*Fomes igniarius*) is common in the poplars, and in its initial stages causes the wood to discolor.

QUESTION: Kindly inform me if you know of any tree the name of which sounds like "Ulan." —W. R. W., New York.

ANSWER: Yulan is a chinese magnolia, *Magnolia denudata*, also known as *M. Conspicua*. which occasionally attains a height of fifty feet. Its many fragrant white or rose colored flowers appearing in early spring before the leaves, make it one of the most showy of all magnolias. It is cultivated in Central China and in this country as an ornamental. A direct translation of the Chinese word *Yulan* is said to be gem plant.

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Forestry in Congress

The Agricultural Appropriation Bill, H. R. 15356, as described in AMERICAN FORESTS for January, was reported to the Senate by the Subcommittee on Agricultural Appropriations on January 14. The committee consists of members of the Agricultural Committee and of the Appropriations Committee, with Senator Charles L. McNary, of Oregon, chairman. Other members of the committee are Senators Wesley L. Jones, of Washington, Arthur Capper, of Kansas, Henry W. Keyes, of New Hampshire, Ellison D. Smith, of South Carolina, William J. Harris, of Georgia, John B. Kendrick, of Wyoming, Carl Hayden, of Arizona, Gerald P. Nye, of North Dakota, W. B. Pine, of Oklahoma, and Royal S. Copeland, of New York, who succeeds the late Senator Overman, of North Carolina.

An item of $12,500 with which to maintain a forester among the foreign agricultural attachés was re-instated in the bill. Senator Frederic C. Walcott, of Connecticut, told the committee that the possibilities of such a service include studies of Europe's experience in land use, forest taxation, management of privately owned forest properties, and the productive capacity of the several European forest regions.

On January 2, The American Forestry Association sponsored a public hearing before Colonel J. Clawson Roop, Director of the Bureau of the Budget. In opening the presentation Representative Burton L. French, of Idaho, pointed out that Idaho's economic life depends largely upon the white-pine lumber industry, the area of which is more than half in Federal ownership. With Representative French were Senators William E. Borah and John Thomas, and Representative Addison T. Smith, of Idaho. Reference was made to the conference called by Governor Baldridge in Moscow, Idaho, on November 8, to lay plans for attacking blister rust on all lands whether privately owned or in the National Forests. Other speakers included C. B. Sanderson, general manager of the Milwaukee Land Company, with headquarters in Seattle, Washington, and vice-president of the Western Forestry and Conservation Association; Dean F. G. Miller, of the Idaho School of Forestry at Moscow; Dean Henry Schmitz, of the School of Forestry, University of Minnesota; C. C. Scott, of the Oregon Forest-Fire Protective Association; Professor Emanuel Fritz, of the Department of Forestry, University of California; J. J. Underwood, of the Seattle Chamber of Commerce; Franklin W. Reed, of the National Lumber Manufacturers Association, Washington, D. C.; O. M. Kile, representing the Chipman Chemical Company, Bound Brook, New Jersey; and G. H. Collingwood, Forester for The American Forestry Association. The hearing brought out clearly that white-pine forests comprising over 3,100,000 acres in Idaho and other parts of the Inland Empire, together with white sugar-pine stands of even greater area in Oregon, Washington and northern California are seriously threatened by the white-pine blister rust. Although Senator John Thomas, of Idaho, asked the committee to increase the amount allotted for controlling the disease on National Forests from $45,000 to $250,000, only $50,000 were added. Likewise the sum of $80,900 which he asked to be added to sums already allotted to the Bureau of Plant Industry for investigation and co-operative control on state or privately owned lands was reduced to $25,000.

Senator McNary's Committee on Agricultural Appropriations increased a number of other items which had been recommended by the Budget Bureau, but which were not included in the bill when it passed the House. Among these were the following: $33,700 to the Forest Products Laboratory at Madison, Wisconsin, for studies to control shrinkage in wood, to improve the construction of frame buildings and increase the efficiency of paint on wood; $8,000 for further development of forest-fire weather research and service; and $14,188 for studies of the Dutch elm disease and heart rot in hardwood trees. To establish a sub-station for studies of forest management in North Dakota, $15,000 were added, and another $15,000 for soil erosion studies in the southwestern region.

Members of the Senate Committee on Public Lands who accompanied Chairman Gerald P. Nye, of North Dakota, on an inspection of the area to be included within the proposed Tropic Everglades National Park, in Florida, returned to Washington on January 4. The Senate Committee is expected to make an early report, as is also the House Committee on Public Lands whose hearings were completed on December 18.

On December 17, Senator McNary introduced a bill, S. 5407, to enable the Federal Government to meet emergencies caused by insects or diseases threatening the forests on Federal lands. This would set up annually $500,000 to meet such emergencies. Expenditure of any sums from this fund would be directed by the Federal Protection Board, acting under the Chief Coordinator of the Bureau of the Budget, and consisting of the Forester, the Director of the National Park Service, the Commissioner of Indian Affairs, the Commissioner of the General Land Office, the Chief of the Weather Bureau, the Chief of the Division of Forest Insects of the Bureau of Plant Industry, and the Chief of the Biological Survey. This bill will replace Senator Oddie's bill, S. 3130, which was referred to the Committee on Agriculture and Forestry January 6, 1930.

The House Committee on Agriculture, under Representative Gilbert N. Haugen, of Iowa, heard statements from representatives of the Department of Agriculture and from national organizations on January 12, regarding H. R. 12717, authorizing additional appropriations of $200,000 for the purchase of land for the National Arboretum in the District of Columbia, introduced by Representative Robert Luce, of Massachusetts.

A companion bill, S. 4586, introduced by Senator McNary, passed the Senate on June 27. These two bills supplement the law passed in 1927 which created the National Arboretum and appropriated $300,000 with which to purchase the necessary land. A total of 268 acres have been acquired, or are in process of condemnation. An additional area of 126 acres will be purchased with the passage of the bill.

The Emergency Construction Bill, H. R. 14804, which had been before Congress since the first of December was signed by President Hoover and became a law on December 20. This makes available immediately and until June 30, 1931, a total of $116,000,000 for construction of public works. Of this amount $6,000,000 are for use on National Forests—$3,000,000 for the construction and maintenance of roads, trails, bridges and fire lanes, and $3,000,000 for the construction and improvement of National Forest highways. Another $3,000,000 for the survey, construction and maintenance of main roads through the unreserved public lands, and $1,500,000 for construction and maintenance of roads and trails on the National Parks and National Monuments under the Department of the Interior. This, together with $80,000,000 for the Federal-Aid Highway System, makes a total of $90,500,000 for roads, trails and similar construction. The remainder is allotted to the Corps of Engineers of the War Department—$22,500,000 for river and harbor work and $3,000,000 for flood control on the Mississippi River.

Conservation Calendar in Congress

This monthly feature is a service to the members of The American Forestry Association

BILLS PASSED

S. Res. 350—Walcott—To authorize the Senate Wild Life Committee to expend $10,000 in addition to the amount heretofore authorized. Reported and agreed to December 18.

H. R. 14804—Appropriation for Emergency Construction Fund for public works for remainder of fiscal year ending June 30, 1931. Reported to House Dec. 9. Passed House Dec. 9. Reported to Senate with amendments Dec. 10. Passed Senate Dec. 11. Sent to Conference. Conference report adopted by House Dec. 19 and by Senate Dec. 20. Approved Dec. 20.

S. J. 211—McNary—For the relief of farmers in the drought and storm stricken areas of the United States. Reported to Senate Dec. 8. Passed Senate Dec. 9. Reported to House Dec. 17. Passed House and sent to conference Dec. 18. House and Senate adopt conto to House Dec. 16. Passed House Dec. 19. Reported to Senate January 14, Report No. No. 1268.

H. J. Res. 447—Appropriations for drought relief purposes. Reported to and passed House Jan. 5. Reported to Senate with amendment Jan. 5. Passed Senate Jan. 5.

APPROPRIATIONS

H. R. 15256—Dickinson—Agricultural Appropriation Bill, fiscal year 1932. Reported to House Dec. 16. Passed House Dec. 19. Reported to Senate January 14, Report No. 1268.

H. R. 14675—Cramton—Interior Department Appropriation Bill, fiscal year 1932. Reported to House Dec. 8. Passed House Dec. 12. Reported to Senate Dec. 16.

H. R. 15592—Wood—First Deficiency Appropriation Bill. Reported to House January 5. Passed House Jan. 7.

H. R. 14450—S. 5079—S. 4783—Emergency Constructions Bills. All referred to Committee on Appropriations.

FORESTRY

S. Document No. 223—Report of the National Forest Reservation Commission for the fiscal year ended June 30, 1930. Printed.

S. 5407—McNary—To enable coordinated Federal effort to meet emergencies caused by forest-destroying insects and diseases. Referred to Committee on Agriculture and Forestry Dec. 17. H. R. 15602—Leavitt, Bill similar to above.

H. R. 14677—Green—Providing for the purchase and maintenance of certain lands and timber in Florida by the Department of Agriculture for research purposes in making a study of naval-stores production from pine trees. Referred to the Committee on Agriculture Dec. 8.

H. R. 14909—Englebright—To add certain lands to the Modoc National Forest in the State of California. Referred to Committee on Public Lands Dec. 10.

H. R. 15270—Lankford—Authorizing the Secretary of Agriculture to establish and maintain in the naval-stores section of the United States a pine forest products laboratory. Referred to Committee on Agriculture Dec. 16.

PARKS

S. 5250—Jones—To extend the south and east boundaries of the Mount Rainier National Park, in the State of Washington, and for other purposes. Referred to the Committee on Public Lands and Surveys December 11.

S. 5267—Shortridge—Authorizing the Secretary of Commerce to convey certain lands to the county of Los Angeles, California, for park purposes. Referred to the Committee on Commerce December 11.

H. R. 14997—Hawley—Providing for the creation of a National Park in Marion County, Oregon, to be known as the Silver Creek Falls National Park, and authorizing the appropriation of money therefor. Referred to the Committee on Public Lands Dec. 11.

H. R. 15008—Summers—A bill to extend the south and east boundaries of the Mount Rainier National Park in the State of Washington, and for other purposes. Referred to the Committee on the Public Lands Dec. 11.

S. 5250—Jones—Bill similar to above. Referred to Committee on Public Lands.

S. 5248—Norbeck—To extend the boundaries of Wind Cave National Park, South Dakota, by adding thereto an area of 320 acres. Referred to Committee on Public Lands.

S. Res. 341—King—To authorize an increase for construction of roads within National Parks from $5,000,000 to $7,500,000 a year. Referred to the Committee on Agriculture and Forestry Dec. 2.

CONSERVATION

H. R. 14061—Summers—Authorizing compacts among states for agricultural and conservation purposes. Referred to Committee on Agriculture Dec. 2.

S. 3557—McNary—For acquisition and sale of certain timberlands to Oregon for recreational and scenic purposes. Passed Senate June 11, 1930. Reported to House June 18, 1930. Recommitted January 5.

INDIAN AFFAIRS

S. 4828—Thomas—Authorizing the President to appoint a commission to study, report, and recommend on a Government policy in relation to the American Indians. Referred to Committee on Indian Affairs December 2.

S. 5206—Thomas—Authorizing the President, through the Secretary of the Interior, to study, report, and recommend on a revision and codification of the statutes affecting the American Indians. Referred to Committee on Indian Affairs Dec. 9.

MISCELLANEOUS

S. J. Res. 212—McNary—To coordinate the fiscal business of the United States Department of Agriculture and the Alaska Game Commission in Alaska, and for other purposes. Referred to the Committee on Agriculture and Forestry.

H. Res. 323—Black—Providing for the appointment of a Committee on Economic Planning. Referred to Committee on Rules Dec. 17.

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S. Res. 351—Steiwer—To direct the Secretary of the Treasury to investigate the extent to which convict labor is used in the manufacture or production of timber products in any territory subject to the jurisdiction or control of the Union of Soviet Socialist Republics, and to report thereon to the Senate at the earliest practicable date. Ordered to lie over under the rule Dec. 3.

S. Res. 354—King—To conduct a thorough investigation regarding antitrust laws. Referred to the Committee on the Judiciary Dec. 4.

S. Res. 379—Walsh—To inquire into the charges regarding oil-shale lands of the United States. Referred to Committee on Public Lands and Surveys Dec. 19.

S. 4848—Oddie—To prohibit the importation of any article or merchandise from the Union of Soviet Socialist Republics. Referred to Committee on Finance Dec. 2.

H. R. 12094—Allgood—Conveying certain lands to the State of Alabama for vocational or other educational uses. Reported to House Dec. 11 (Report No. 2094). Passed House January 5.

H. R. 15423—Carter—To provide for plant and cereal patents. Referred to Committee on Patents Dec. 18.

WILD LIFE

S. 5290—Wheeler—Authorizing the purchase and installation of a mechanical fish screen on the Sun River Canal, in the State of Montana. Referred to the Committee on Commerce Dec. 11.

H. R. 15274—Leavitt—Bill similar to above. Referred to Committee on Irrigation and Reclamation.

H. R. 14072—Denison—To provide for the protection of birds and their nests in the Canal Zone. Referred to the Committee on Interstate and Foreign Commerce Dec. 2.

H. R. 13276—Arentz—A bill to establish the Needles Rocks Wild Life Refuge. Reported December 11 from Committee on Indian Affairs without amendment. (Report No. 2095). Passed House Jan. 5.

For bills introduced in the last session and carried over into the present short session of Congress, reference should be made to the August issue of this magazine, page 529.

Would Eliminate Black Currants

Because of the relatively small value of cultivated black currants in this country and the role of these plants in the spread of white-pine blister rust, the United States Department of Agriculture recommends that farmers and nurserymen and the public generally discontinue growing these currants in regions where white pines grow. The English black currant is by far the most susceptible to the rust, and is said by Department specialists to be responsible for spread of the disease over long distances.

So great is the danger from cultivated black currants that the Department would eliminate this plant entirely in the Pacific, Rocky Mountain, Atlantic, Appalachian, Ohio Valley, Upper Mississippi Valley and Lake States.

Marckworth With Georgia Forest School

G. D. Marckworth, formerly assistant state forester of Maryland and later connected with the University of Louisiana, has been named to head the Forestry Division of the Georgia State College. He was graduated from the Ohio State University in 1916, and received his M. S. degree in Forestry at the Yale Forest School in 1917. In 1919 he attended the University of Edinburgh, in Scotland, studying British forestry methods and conditions.

He was formerly connected with the State Forest organizations of Virginia, Texas, Tennessee and Maryland.

Maughan Joins Duke Forest Staff

William Maughan, Instructor in Applied Forestry at the Yale Forest School, was, on January 1, appointed Assistant Director of the Duke Forest and Assistant Professor of Forestry at Duke University, in North Carolina.

Mr. Maughan is a graduate of the Forestry School of the University of Minnesota and the Yale Forest School. From 1925 to 1928 he served as instructor in forest engineering at the New York State College of Forestry, at Syracuse University, going to the Yale Forest School under the Charles Lathrop Pack Foundation.

His first work at Duke University will be to organize the Duke Forest as an operating demonstration, research and school forest in cooperation with Dr. C. F. Korstian, director of the forest.

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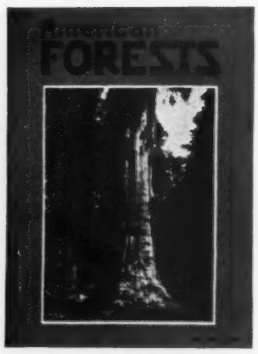

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Chaining the Mississippi

(*Continued from page* 106)

range from a few hundred to two or three thousand dollars per gully, and is often quite a heavy charge upon the acreage protected, it is actually cheaper from the standpoint of the public than dredging material out of the channels of navigable streams. In short, while effecting an actual benefit to farms, by filling gullies and building land, the state or Government could better afford to build dams which would hold back millions of cubic yards of sand, than to dredge such material out of stream channels when it has become an impediment.

While it is logical to assume that the public agency to undertake erosion control on a large and effective scale is the agency charged with the control and improvement of rivers, other agencies, such as railroads and highway departments, are so deeply concerned with the prevention of flood and erosion damage that many of their efforts might well be directed to the elimination of causes. It is obvious that new construction on railroads and highways produces bare soil surfaces from which runoff and erosion may be considerable. Better standards of highway construction, particularly, might well be insisted upon by the Federal Bureau of Public Roads, and thus passed down to state and county highway departments, which would eliminate a great deal of unnecessary and costly erosion. On the other hand, road and railroad fills and bridges are repeatedly damaged by torrential waters and it is merely sensible expediency that those responsible for the repair of such damages should direct some of their effort toward preventing inevitable washouts and wash-ins. What has been done in this line deserves the greatest credit, but it is only a drop in the bucket. Much more could be done by maintenance departments which would not only reduce their own expenses but contribute to the general cause of soil saving and stream improvement.

The control of soil erosion is one of the greatest tasks in the field of conservation ever undertaken anywhere. The history of agriculture in New England indicates what it may mean to the soil resources of the country to neglect it, although the deeper and less stony soils of the Mississippi Valley will not, as a rule, become totally untillable quite so quickly. The farmer who permits excessive runoff from his land to injure a neighbor or to damage public property is maintaining a nuisance and the police powers should be invoked to compel certain reasonable individual performance in meeting the situation. From many angles, however, the control of soil erosion on farms, and especially as between farms, is a community enterprise rather than one for which the individual should be held responsible. Every available force is needed to accomplish effective results.

At the same time the control of erosion through the checking of destructive gullying, and where necessary through the ponding and settling of smaller streams into which excessive quantities of silt are being poured, offers relief to the conditions of larger streams which can be obtained in no other way. In this relation it becomes a state and national responsibility. Sufficient works of this kind promise at least a partial return to the original satisfactory condition of the streams in which they were bequeathed to us. What this may mean to navigation and flood control has already been elaborated upon.

The plan of stream control upon the land implies working with nature to repair the damage to land and to stream, instead of erecting enormous barriers against her relentless forces; it means an intelligent compromise with nature in order that land use may proceed safely and largely unimpeded, instead of a stupid conflict of brute strength with her. It means a chance to win the battle without enormous and unending expenditure. To some extent it probably means taking land which never should have been cultivated out of cultivation to be employed for pasture or forest. Such a tendency should benefit rather than harm the individual farmers and the entire agricultural interest.

Alabama Has First State Park

The first state park legally established in Alabama was recently set aside by Governor Graves. The tract of 421 acres is located on the banks of the Coosa River in the southwestern part of Talladega County. It possesses marked scenic values and at the same time is readily accessible. It will be kept as far as practicable in a wild and natural condition.

Recreation Exposition Postponed

Because of the additional time necessary for organizations to more adequately prepare programs and exhibits for the first National Recreation Exposition, and to permit the management of the Eastern States Exposition to carry out an extensive additional building program, the dates of the exposition originally set for May 30 to June 6, 1931, have been advanced to a similar date in 1932. The exposition will be held at Springfield, Massachusetts.

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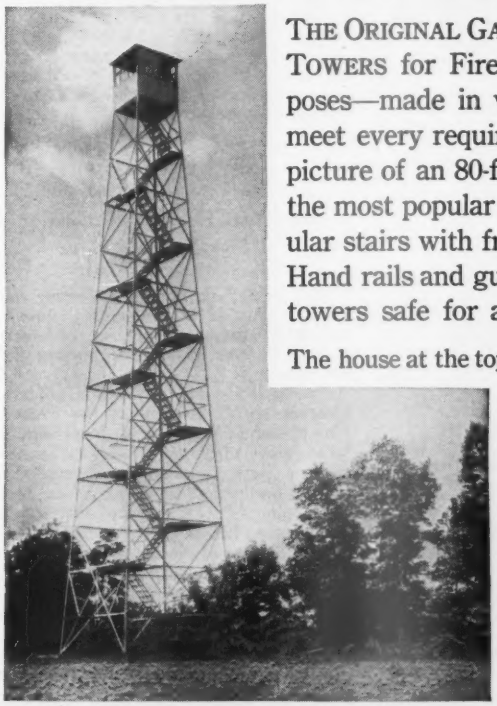

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With Fuertes in Florida

(*Continued from page* 73)

those days, was splendid to behold. Their affinity was much like that of a father and favorite son between whom had grown some special bond of sympathy and mutual interest; or, perhaps, even more like that between master and disciple, only there was perfect freedom combined with gentle deference and due restraint on the part of the younger man. The source of Fuertes' affection, and even reverence, for Abbott Thayer, whom he always addressed as "Uncle Abbott," lay deeper than in the mere bond of their mutual interest in art and natural history. It had its roots far deeper than that, for it was essentially mystic and spiritual. More than a quarter of a century after our camping trip to North Indian Field, and on the occasion of my second meeting with Fuertes since that, to me, most memorable experience, he told me of having just seen an exhibition of Thayer's paintings in New York City. With deep emotion, he spoke of the work of his master, remarking that no one could look, with understanding, upon these paintings without being deeply sensible of their profound mystical and spiritual qualities. In fact, he said, "tears came into my eyes as I looked upon them."

A few years ago, it fell to my lot to revisit this spot which has since been associated in my mind with this memorable camping experience; but alas, the hand of the despoiler had been there. The once beautiful and picturesque palm grove had been partly cut down and destroyed, and the burned, blackened trunks of the trees were lying prostrate on the ground. A railroad had been built from the coast and crossed the marsh to the great cypress swamp beyond, which was being systematically cut out by a lumber company. The herons and egrets and the great flock of white ibises were mostly gone, and the trumpet calls of the sandhill cranes were heard less frequently and came from farther distances. These things had vanished, never to return. Their passing bore mute and tragic witness to the despoliation of a land upon which the destructive hand of man has been very heavily laid; but for me, they are forever enshrined in memory as cherished tokens of my first meeting, years ago, with America's beloved and gifted artist-naturalist, Louis Agassiz Fuertes.

New York Has Rare Collection of Five-Needled Pines

The New York Botanical Garden contains a rare collection of five-needled pines which invariably attracts the interest of blister-rust control workers visiting or passing through the city.

Among the species listed in a guide to the pinetum are *P. cembra,* or the Swiss stone pine of Europe and Siberia; *P. excelsa,* Himalayan white pine; *P. flexilis,* limber pine of western North America; *P. koraiensis,* Korean pine of northern Asia; *P. parviflora,* Japanese white pine; *P. Peuce,* Macedonian pine of southeastern Europe, and *P. Strobus,* the eastern white pine of North America.

The seeds of the Swiss stone pine are about the size of hazel nuts and are much relished in Russia and Siberia. An oil used for lamps is expressed from the shells and an oil distilled from the young shoots was once believed to possess extraordinary health-giving qualities. Japanese white pines are a favorite of Japanese gardeners and are dwarfed and trained by them into many fanciful shapes.

WHO'S WHO

Among the Authors in This Issue

C. G. Bates

C. G. Bates (*Chaining the Father of Waters*), in charge of the work in reforestation, genetics and forest influences at the Lake States Forest Experiment Station, St. Paul, Minnesota, has been devoted to forest research since his graduation from the University of Nebraska Forest School. For sixteen years he has been experimenting with the effects of forest on streamflow.

Alden H. Hadley (*With Fuertes in Florida*) is assistant to the President of the National Association of Audubon Societies.

Raphael Zon (*Forestry and the Economic Crisis*) is director of the Lake States Forest Experiment Station, at St. Paul, Minnesota, and one of the foremost forest research authorities in the world.

Heister Dean Guie

Fred L. Kiser (*Through the Lens*) of California, is one of America's best known outdoor photographers.

Heister Dean Guie (*A New Washington Elm*) chose journalism for his life's work after his graduation from the University of Washington, and is now connected with a Seattle newspaper.

William McNeel (*A Forest Page for Boys and Girls*) is assistant state club leader of Wisconsin, making his home at Madison.

William T. Cox

William T. Cox (*The Beginning of Forestry in Brazil*) is the organizer of the Brazilian Forest Service, which he undertook in 1929. He has long been identified with conservation work in the United States, serving as state forester of Minnesota and superintendent of the Upper Mississippi River Wild Life and Fish Refuge.

Adelaide Borah (*Old Trees of Washington*) is a writer of Washington, D. C.; H. O. Bishop (*Lord Fairfax and Washington*) also is a writer well known in the Nation's Capital; W. R. Mattoon (*Forest Flashes from the South*) is Extension Forester, Branch of Public Relations, U. S. Forest Service; J. P. Locke (*All in a Day's Work*) is from Canaan, Vermont; G. G. Nearing (*A Link With the Coal Ages*) has a nursery at Arden, Delaware; and Earle W. Gage (*Racing the Snow Trails*) calls Asheville, New York, his headquarters.

The American Forestry Association

1727 K STREET, NORTHWEST

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ADEQUATE FOREST FIRE PROTECTION by federal, state, and other agencies, individually and in cooperation; the REFORESTATION OF DENUDED LANDS, chiefly valuable for timber production or the protection of stream-flow; more extensive PLANTING OF TREES by individuals, companies, municipalities, states, and the federal government; the ELIMINATION OF WASTE in the manufacture and consumption of lumber and forest products; the advancement of SOUND REMEDIAL FOREST LEGISLATION.

The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

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